

FEB 5 1935

MEDICAL LIBRARY

Canadian Public Health Journal

Devoted to the Practice of

PREVENTIVE MEDICINE

VOLUME 26

January, 1935

NUMBER 1

CONTACT WITH INFECTION IN TUBERCULOSIS

S. L. CUMMINS

PUBLIC HEALTH IN PRINCE EDWARD ISLAND

B. C. KEEPING

WADING POOL SANITATION

W. J. McCORMICK

HOUSING IN MONTREAL

AIME COUSINEAU

VETERINARY BIOLOGICS

GEORGE HILTON

Published by the

CANADIAN PUBLIC HEALTH ASSOCIATION

Editorial and Business Offices:

105 BOND STREET, TORONTO 2

NO MORE PRIVACY THAN A GOLDFISH



Irvin Cobb wasn't talking about Vacuum chlorinators when he made that remark—but he might well have had them in mind.

Trouble in a Vacuum chlorinator doesn't have a chance to develop into anything serious because the working parts are under the glass bell jar, always in plain sight.

Just drain the tray, lift the bell jar and any necessary adjustments or cleaning can be done immediately.

That is just one more reason why you can count on W&T (made in Canada) Vacuum chlorinators for dependable, low cost operation.



"THE ONLY SAFE WATER
IS A STERILIZED WATER"

Ask for Technical Publication 38.

WALLACE & TIERNAN LIMITED

*Manufacturers of Chlorine and Ammonia
Control Apparatus*

350 Soranren Avenue, Toronto, Ontario

201 Bank of Hamilton Bldg., Winnipeg, Manitoba
New Birks Bldg., Montreal, Quebec



Contact with Infection in Tuberculosis

ITS ROLE IN DISEASE PRODUCTION AND PROTECTION

S. LYLE CUMMINS, C.B., C.M.G., M.D.

Welsh National School of Medicine, Cardiff

THOSE who have occasion to study the history of individual cases of tuberculosis, especially in rural or semi-rural districts, must be constantly reminded of the serious risk associated with home contact with an open case.

This risk has been well stressed by Midgeley Turner¹ and many others in this country and has been clearly demonstrated, by Lissant Cox² and his co-workers, to be especially great in the early years of life.

Asserson³ expresses the heart of the matter as follows: "Infants subjected to continuous exposure in the home have only a slight chance of escaping disease and death from tuberculosis". This opinion has been more recently confirmed by the careful co-ordination of tuberculin tests and post-mortem findings in young children by Blacklock⁴ in a report to the Medical Research Council.

But there is another side to the question, also raised by Asserson in her valuable paper already quoted: that "infants who receive their infection in a more casual and less continuous way show marked resistance to tuberculous infection".

Important as it is to stress the danger of home contact as the most fruitful agent in the production of our tuberculosis incidence and mortality, it is also of great importance to bear in mind the possibility of the self-immunisation which may go with exposure to infection of a less massive kind and at less susceptible stages than the early months of infancy.

Even in families so heavily infected that a majority of the members have developed tuberculous disease there remain, almost always, a few in good health; and although these may be destined to break-down later, since they are invariably infected and we know that many years may elapse before the seed reaches fruition, the fact that they very often escape altogether from manifest disease during a long life serves to mark them out as having either originally possessed or else early acquired a greater resistance than the others.

Drolet⁵, in a challenging paper in which he adduces statistics to show that both incidence and mortality are actually lower in the descendants of tuberculous than in those of non-tuberculous parents in New York, poses the question—"Why should not there be greater resistance to the spread of tuberculosis into a disease condition where the stock has already been tuberculized?". Why, indeed? The theory of hereditary immunity against tuberculosis had, in point of fact, been clearly enunciated, several years earlier, by Sanarelli⁶ who set forth his opinion in these words:—"Quella che si trasmette per eredità famigliare non è la predisposizione, ma la graduale resistenza e la progressiva immunità." My own opportunities for the study of the extreme susceptibility of African natives, even those proved by tuberculin tests to be already infected with latent lesions, and their tendency to breakdown, under industrial or military stress, into acute fulminating tuberculosis, led me⁷ to a somewhat similar though not identical opinion; to a theory, in fact, of an inherited power in the white race, long accustomed to tuberculisation, to react sharply to first infection by the acquisition of immunity, as contrasted with a lack of this self-immunising power in the black races whose reactions are manifested in extreme hypersensitivity rather than in resistance "to the spread of tuberculosis into a disease condition". This postulates the inheritance of a *power* to react favourably but leaves to the individual the actual acquisition of immunity under the influence of infection.

The worst of these theories is that they are so difficult to prove! Almost every argument by which they can be supported might apply equally well to the theory of inherited pre-disposition or might be countered by the fact that the black races never enjoy as favourable an environment as the whites and that comparisons are, therefore, misleading.

Some ten years ago, shortly after my arrival for work in tuberculosis in Wales, I was able, through the kind co-operation of my colleagues in the Welsh National Memorial Association, to gather together some three thousand odd case records, all collected on pre-arranged lines, which included a classification devised for the purpose of expressing the relative severity of the clinical types as seen at our tuberculosis institutions as well as details as to family history and duration of illness. A preliminary analysis of these records, together with a description of the methods used, appeared in "Tubercle"⁸ in May, 1926, but it was recognised that time must elapse and an attempt at a "follow-up" be attempted before much use could be made of the collected data. Since then, through the unfailing industry of my secretary, Miss K. L. Gough, it has been possible to check off the deaths from year to year as they were reported through official channels and finally to obtain, from my colleagues of the medical staff of the Welsh National Memorial Association, to whom nominal rolls for each area were sent out, details of the present condition of survivors at or about ten years after the first attendance of the patients. The facts thus collected require much time and work for their final analysis but it has seemed worth while to abstract, at the present time, some of the data bearing on my alternative theory, the presence of some

degree of self-immunisation in patients prior to or after the development of manifest clinical tuberculosis.

In the first place, it may be said that the records seem to emphasize the terribly serious effects of contact with open cases in the production of tuberculosis incidence. Of the 3,083 records analysed, 40 per cent were found to give a history of direct association with a known case or cases prior to becoming tuberculous, the contact being such as to justify the assumption that the infection was probably contracted as a result. If this proportion of known contact infection holds for all the tuberculosis cases in Wales, the figure must be taken to imply that open cases are a very serious source of production of the disease.

In 1931 there were in Wales 2,749 deaths from tuberculosis from a population of 2,593,320. If we accept as reliable the "ten to one" measuring stick of the Framingham experiment, this should mean that there existed ten actual cases for every death, or 27,490 cases in Wales during that year, which was included in and not materially different from the eight or ten years in which the case histories were gathered. If 40 per cent of the cases dying in 1931 were, as in my recorded series, aetiologically associated with home or early contact with infection, this would mean that 27,490 tuberculous persons produced 1,100 cases and the remaining 2,565,830 persons only 1,649 (or 60 per cent) of the annual mortality. It is not suggested that an estimate based on such assumptions is in any statistical sense accurate but it must, in some degree, reflect the facts and support the contention that it is chiefly from infected homes that the harvest of tuberculosis is gathered.

But while there is reason to regard "infective contact" in the home as the most important factor in the production of cases, is there also evidence that such contact carries with it some compensation in the form of an increased resistance against the disease? In a previous analysis⁸, I called attention to certain facts which pointed to this conclusion and it seems worthwhile to reproduce here two tables then published.

TABLE I

RELATION BETWEEN CLINICAL TYPES (INMAN'S CLASSIFICATION) AND HISTORY OF "INFECTIVE CONTACT"

Clinical type		Total number	Number with "contact" history	Percentage with "contact" history
<i>Acute initial cases</i>	(a (resting febrile).....	1,078	334	38
	(b (ambulant febrile).....	655	258	39
	(c (ambulant afebrile).....	517	228	44
<i>Chronic recrudescent cases</i>	(a (resting febrile).....	349	125	36
	(b (ambulant febrile).....	355	129	34
	(c (ambulant afebrile).....	392	165	42

TABLE II
RELATION BETWEEN CLINICAL TYPES (INTERNATIONAL STADIA) AND
HISTORY OF "INFECTIVE CONTACT"

Clinical Type		Total number	Number with "contact" history	Percentage with "contact" history
<i>Acute initial cases</i>	Stadium 1.....	358	161	45
	Stadium 2.....	895	357	40
	Stadium 3.....	803	304	38
<i>Chronic recrudescent cases</i>	Stadium 1.....	114	52	45
	Stadium 2.....	396	152	38
	Stadium 3.....	583	215	37

From Tables I and II it will be seen that amongst those with a history of "contact" there existed, in every group analysed, a larger proportion of relatively favourable types.

Now that the deaths over a period of from eight to ten years are known, it is possible to compare the mortality amongst the groups with "no known contact" and the "contact" groups. This comparison is best made amongst the female cases as women always know much more about their own family history than males, from whom reliable data as to infected relatives are difficult or impossible to obtain. Table III, based on female patients, brings out this improved survival amongst those with a history of "contact".

TABLE III
SURVIVALS AMONGST "CONTACT" AND "NO KNOWN CONTACT" CASES
(FEMALES)

		Living		Dead	
<i>Acute initial cases</i>	Known contacts	202	(41%)	290	(59%)
	No known contact	288	(33%)	575	(67%)
<i>Chronic recrudescents</i>	Known contacts	106	(46%)	125	(54%)
	No known contact	150	(41%)	216	(59%)

Even amongst the "contact" group, those who came to notice as tuberculous directly from the infected home, that is to say, those who had actually developed the disease while in contact with an infected relative, survived in larger numbers than those whose "contact" had ceased from two to five years before the development of disease and in whom the immunity derived from frequent small re-infections might be supposed to have waned; the mortality, during the eight or ten years of observation, being only just fifty per cent in the former group but over sixty per cent in the latter. There may be an

element of error in this, however, since some of the "immediate contact" group must have been detected during the examination of families for "contacts" and so may have tended to survive longer through being earlier recognised and thus brought under appropriate treatment. That this cannot be the whole explanation is shown when we compare the deaths at corresponding "stadia" in the "contact" and "no known contact" groups, as is done in Table IV.

TABLE IV
DEATHS IN "KNOWN CONTACT" AND "NO KNOWN CONTACT" GROUPS
(ACUTE INITIAL CASES IN FEMALES)

	Stadium 1		Stadium 2		Stadium 3	
	Total Number	Dead Per cent	Total Number	Dead Per cent	Total Number	Dead Per cent
"Contact"	105	25	214	53	173	86
"N.K.C."	124	29	394	60	345	87

The trend is in the same direction in the "chronic recrudescent" female cases and in male cases and, though the differences are not great, they seem to be consistently in favour of a slightly lower mortality amongst the groups giving a history of previous known contact with open cases.

These results, such as they are, appear to lend some support to the main thesis of Drolet that patients from tuberculous homes,—he speaks chiefly of those descended from tuberculous parents but I lay stress rather on the previous contact which the children of infected parents must have experienced—tend to possess more resistance to "the spread of tuberculosis in the tissues" than those whose previous history includes no known tuberculous relationship or association. Is this slightly better resistance attributable to an *inherited* immunity or to a relatively enhanced resistance acquired through early contact with infection?

There is good reason to think that a considerable increase of resistance is actually gained during the struggle with an active infection. It would be difficult to maintain that a child with acute spinal caries has *inherited* much immunity to tuberculosis; but we meet many a healthy man with a kyphos to prove that he was once an acute spinal case. Is it not natural to assume that such a man during his illness *acquired* the resistance to which he owes his recovery?

In 1886, Marfan, in a paper entitled "*De l'immunité conférée par la guérison d'une tuberculose locale pour la phthisie pulmonaire*,"⁹ enunciated the following views: "I made my observations on all patients bearing traces of healed cervical gland tuberculosis (by "healed" I mean those with perfect, complete healing with scars above suspicion in their whole extent). Actually, all these healed glandular cases were free from pulmonary tuberculosis. On the other hand, I observed the declared cases of pulmonary phthisis in hospital and, searching the glandular areas, I was unable to find any instances of healed tuberculous glands When I encountered the co-existence of tuberculous glands and pulmonary phthisis, the glands were found not to be healed These were instances not of old healed tuberculosis but of a tuberculosis in active evolution with multiple local manifestations."

In the investigation now under consideration, I attempted to search still further in the same direction and to ascertain, if possible, whether, even in the course of a tuberculosis in active evolution, there might not be found some evidence of this same self-immunisation in the form of a greater resistance to the progress of the malady in those who had already proved themselves to possess the power of restraining its earlier manifestations, as compared with those in whom the disease had gone forward, up to the time of observation at least, without any sign of check. To this end, in the classification adopted, cases of pulmonary phthisis were divided, according to the history and duration of the disease, into two main groups, *acute initial* and *chronic recrudescent*, defined as follows: "A case is to be regarded as *acute and initial* when the progress of the illness has been continuous from the start, without healthy intervals of any considerable duration. If the disease has continued to progress for more than two years it ceases to be *acute and initial* and passes into the *chronic and recrudescent* group for the purpose of classification A case is regarded as *chronic or recrudescent* when there have been previous signs of tuberculous infection, such as haemoptysis, pleurisy, bone, joint, or gland disease, abdominal or pulmonary infection, but where these have been separated from the present illness by periods of relatively good health. All cases of over two years' duration are to be classified under this heading. It should be noted that acute exacerbations in the course of chronic phthisis fall into the *chronic recrudescent* group."

It will be seen that all Marfan's cases of "healed glands" and those of lupus also dealt with by him, would have been included under the *chronic and recrudescent* group had they, by chance, "given him the lie" and developed pulmonary phthisis later; but my group would also have included many instances of what Marfan called "tuberculosis in active evolution" only provided that there had been intervals of relatively good health between the glandular and the pulmonary attacks. It is now possible to compare the *acute initial* and the *chronic recrudescent* groups so classified in 1923 and 1924 in terms (a) of the total duration of their disease from its first appearance and (b) of the length of life after the examination at which they were classified. The figures are for females as to whom the more reliable information is available.

TABLE V

COMPARISON OF THE AVERAGE SURVIVAL PERIODS OF "ACUTE INITIAL"
AND "CHRONIC RECRUDESCENT" CASES

		Months				
		Under 6	6/11	12/23	24/35	36 and over
		Per cent	Per cent	Per cent	Per cent	Per cent
(a) From first appearance of the disease	Acute initial	10	27	36	12	15
	Chronic recrudescent	2	3	10	21	64
(b) From time of classification	Acute initial	40	23	18	7	12
	Chronic recrudescent	34	22	21	8	15

It may justly be inferred from these figures that the *chronic recrudescent* types tend to defer their first visit to the tuberculosis physician until very late in the progress of the disease, but even then this type seems to possess a better resistance than the *acute initial* case.

This tendency to a longer survival as a tuberculous patient in those with a history of previous manifestations of the disease is but a poor thing, however, as they are, for the most part, equally certain to die of the disease sooner or later. At the end of a period of from eight to ten years after their first consultation with the tuberculosis physician, 66 per cent of the *acute initial* and 58 per cent of the *chronic recrudescent* female cases were dead.

Such immunity, then, as may be gained in the course of infection, is of but equivocal importance once pulmonary tuberculosis has obtained sufficient hold to allow of clinical recognition. The chief interest and value of recognising the existence of this acquired immunity, such as it is, lie in the key which such recognition gives to the comprehension of the relationship between "infection" and "disease" in the more or less universal state of "tuberculisation" in which, and almost by virtue of which, we live our crowded lives in this civilisation of ours. Where this self-immunisation is wanting, that is to say, in infancy and childhood, the danger of infective contact is inordinately great. For those who, in spite of infective contact, have won through to adult life without a break-down in health, the prospects of exemption from clinical tuberculosis are much brighter although there still remains, for them also, the risk that, through some undue strain or some intercurrent illness, the delicate balance between health and disease may yet be disadjusted and tuberculosis ensue. For such persons the chance of a more benign type of disease and a longer survival may afford some small comfort; and it may be assumed that patients of this kind offer more favourable prospects of success through such modern therapies as artificial pneumothorax and other forms of lung collapse.

For those who owe their "infection" to early and casual as opposed to intense familial exposure, there is undoubtedly a delicate adjustment in favour of health in the accustomed environment, an adjustment too delicate, however, to be relied on under all circumstances. Their immunity may be amply sufficient for the maintenance of health in ordinary city life but place them in close contact with an open case in office or factory, and the slight immunity may well prove insufficient. It is chiefly in the contrast with the less resistant races that the true value of such immunity as we possess is evident.

Asserson, already quoted, comparing the susceptible Negro population of New York City with the resistant Jews, showed that these two communities gave the highest and the lowest rates, 398 per 100,000 for the Negroes and only 86 per 100,000 for the Jews. In comparing the infants of these two groups, by tuberculin testing, she found that the degree of early exposure to infection was about the same in both. "But quite a different picture was disclosed by the follow-up study", 5.9 per cent of the Negro infants dying of tuberculosis and only 1.2 per cent of those of Jewish race. Does this mean that Jewish infants have inherited a resistance which is wanting in the Negroes?

Or does it mean that the Jewish infants have an *inherited power* to react to infection in a more favourable way?

We know, from many studies, both in Africa and in America, that the Negro does not fail to *react* to tuberculous infection. He reacts by becoming extremely hypersensitive to the protein of the tubercle bacillus. The Jewish individual reacts too, but in a different way; not by becoming inordinately intolerant to the infection but by becoming relatively immune to it.

All these considerations point, in my opinion, to the conclusion that whatever immunity may be demonstrated to exist against the spread of tuberculosis in the tissues is acquired, not inherited, by the individual. But there is an element of heredity in the matter. Only the old stocks coming of an ancestry freely exposed to tuberculosis in the past seem able to mobilise against infection, when it reaches their tissues, the power of a relatively efficient resistance by which the spread of the invading organism can be more or less localised.

Time, and the gradual improvement of the living conditions in which infection must be met and opposed, may be relied on to endow our own rural populations, and those more primitive peoples associated with us in colonial development, with an increasing power to cope with an infection which seems to be indissolubly linked with all human aggregations as they grow in the course of an industrial civilisation.

REFERENCES

- ¹Midgeley Turner. 1931. *Tubercle*, 12: 145 (January).
 - ²G. Lissant Cox. 1929. "The Fate of Young Children in Tuberculous Households". C. Tingling & Co., Liverpool, London and Prescott.
 - ³Alice Asserson. 1927. *Am. Rev. Tuberc.*, 16: 359 (October).
 - ⁴J. W. S. Blacklock. 1932. *M.R.C. Special Report Series No. 172*.
 - ⁵D. J. Drolet. 1924. *Am. Rev. Tuberc.*, 10: 280 (November).
 - ⁶G. Sanarelli. 1913. "*L'Evoluzione Biologica della Tubercolosi*". Tipografia Editrice Nazionale, Via Gregoriana 9, Roma.
 - ⁷S. Lyle Cummins. 1933. *Transactions of the Twenty-ninth Annual Meeting of the National Tuberculosis Association*, page 26.
 - ⁸S. Lyle Cummins. 1926. *Tubercle*, 7: 375 (May).
 - ⁹A. Marfan. 1886. *Arch. Générales de Médecine*, 7 Série. T. 17 (Tome 157), page 423, Janvier-Juin.
-

The Development of Public Health in Prince Edward Island

B. C. KEEPING, M.D., C.M., D.P.H.

Chief Health Officer for Prince Edward Island, Charlottetown

THE history of public health in Prince Edward Island naturally divides itself into two periods: the first from discovery of the Island by Europeans to 1763; the second from 1763 until the present day.

The name of the discoverer of Prince Edward Island and the date are uncertain. It is commonly believed that Cabot in 1497 visited its shores and gave it the name of Saint Jean, but this is rather improbable. The French claim Verrazano as the discoverer, while others hold that Cartier was the first to sight it in 1534. However, the fact remains that this beautiful little island, "The Garden of the Gulf", was discovered very early in Canadian history and was named Isle St. Jean. The aborigines of Isle St. Jean belonged to the Abenaki and Micmac tribes of Indians. These first inhabitants called it "Abegweit" (resting on the wave), a poetic and descriptive name. There is little known about these savage tribes. The only Indians now found on the Island are Micmacs but very few of them are of pure Indian blood.

Isle St. Jean, along with other parts of Canada, is said to have been claimed by the French king as early as the 16th century. However, this little corner of the New World does not seem to have received any attention for over one hundred years. Towards the end of the 16th century grants were made of various islands in the Gulf to companies desirous of carrying on an extensive fishery. Naturally these had no interest in the permanent colonization of the country, their only object being to erect stages and perhaps a shack or two to carry on their work. In spring a large number of fishermen visited the Island, and in autumn returned to France, leaving the Indians again in undisputed possession.

The first colonists came to the Island about 1719. Both were fishermen from Normandy and had large families. These pioneers were soon joined by others and in 1720 there were seventeen families numbering one hundred and thirty-five inhabitants. At this time Isle St. Jean was under the control of the French commander at Louisburg, Cape Breton. About the year 1728 there was a steady influx of Arcadians from what is now Nova Scotia and so greatly had the population increased that it is thought that in 1763, when the Island along with other French possessions was ceded to the British, the population had reached six thousand inhabitants. During this long period, from 1719 to 1763, the Island was little disturbed by the continual war raging on the adjoining continent between the French and English settlers.

During these years the Roman Catholic clergy kept a very complete record of vital statistics, registering all births, marriages and deaths in the various settlements. Up to this time all the early pioneers and settlers were French,—hence this record was a complete census of the white population.

The fall of Louisburg and Isle St. Jean was soon followed by that of Quebec, and in 1763 a treaty of peace was signed between France and England, ceding New France to the British.

PRINCE EDWARD ISLAND UNDER BRITISH RULE

In 1764 and 1765, Isle St. Jean was completely surveyed by Captain Samuel Holland. From letters and other documents now in London, it is evident that the surveyor-general thought most favourably of Isle St. Jean, not only for its beauty in summer and the value of its fisheries, but for the marvellous fertility of the soil and the general advantages for settlers. Shortly afterwards the Government of England decided to dispose of it in allotments of twenty thousand acres. There were sixty-seven of these. Three were reserved by the Imperial Government and the remaining sixty-four were given to men who appeared to have some claim on the government. This wholesale and indiscriminate disposal of the Island to those few men kept back settlement for many years, as well as responsible government.

In 1773 the first House of Assembly was called together. There is no record of any health measures being considered; the all-absorbing discussion at this Assembly and at later ones was the "Land Question". Isle St. Jean, being so far removed from the main lines of communication—which were then, as well as at present, by way of the St. Lawrence river and the Atlantic seaboard—does not appear to have suffered in the way of epidemics such as smallpox or plague which were all too common in Quebec during the early years of settlement.

In 1799 the island, formerly known as Isle St. Jean, received the name of Prince Edward Island in honour of Prince Edward, Duke of Kent, father of Queen Victoria, who was commander of the troops at Halifax at that time. The population increased steadily, but slowly, due to the absentee landlords who failed to meet their promises as to colonization. Many attempts were made to rectify this condition. General delegations proceeded to England to report in person their grievances, but not until 1851 did Prince Edward Island obtain responsible government.

Legislation Relating to Health

In the year 1832, in the reign of William IV, an Act was passed by the Legislature authorizing the erection of an asylum for the insane, and other charities. In the same year an Act was passed to prevent the importation of infectious diseases into the Island and their spread. An official bearing the title "Health Officer" was appointed at this time. Further legislation, relating chiefly to asylums, was enacted in 1840, 1842 and in 1844.

In the year 1851 legislation was enacted constituting local boards of health. Provision was made for the establishing of hospitals, with particular reference to the treatment of infectious diseases. It was required that the health officer of the province should be appointed by the Lieutenant-Governor, and on May 1, 1851, Dr. W. H. Hobkirk was appointed. Little progress was made,

however, in implementing the legislation. The occurrence of several small epidemics of smallpox during the following ten years served, however, to arouse public opinion and resulted in the passing of a Vaccination Act in 1862, under the terms of which superintendents of vaccination were to be appointed.

With the entrance of Prince Edward Island into Confederation in 1873 the Federal Government assumed responsibility for Maritime quarantine and for the supervision of sanitation of ships and other common carriers. Quarantine hospitals were built and maintained at Charlottetown and Souris. The assumption of these responsibilities by the Federal Government, however, did not constitute a stimulus to the organization of public health by the province, although legislation containing references to matters of health was passed in 1872, 1883, 1886 and 1887. In 1896 an Act was passed providing for the education of the deaf and dumb. It was not until 1908 that an Act entitled "The Public Health Act of Prince Edward Island" was passed to provide for a provincial board and to authorize the formation of local boards of health throughout the province. By this legislation the areas of local boards were related in a general way to the townships. It provided for the appointment of a chief health officer who would serve also as chief superintendent of vaccination. This law remained in force, with some amendments, until 1927, when the present and more comprehensive Act came into force.

PUBLIC HEALTH FROM 1906 TO 1920

The present public health organization is in large measure the result of the work of those who have been interested for many years in the problem of tuberculosis. It will be recalled that the excellent sanatorium provision throughout Canada has been the result of the early efforts of the Canadian Tuberculosis Association to create public interest and, through private philanthropy, to provide accommodation for the treatment of cases. The work resulted in the formation of an Anti-Tuberculosis Society in the province in 1906, under the presidency of Judge Fitzgerald. Almost all the efforts for the improvement of public health during the following twenty years can be traced to the work of the public-spirited citizens organized in the Anti-Tuberculosis Society and in various other agencies. In the following year, under the presidency of Dr. McLaughlan, branches of the Anti-Tuberculosis Society were formed in the different counties. The increasing interest resulted in the organization of local societies, several of the counties being divided into sections. An effective central organization was maintained. Anti-tuberculosis literature was distributed throughout the province and lectures were held in many centres. The movement was heartily received by the public and the foundations were laid for public support of a provincial health programme. In 1908 a free dispensary was organized by the Charlottetown branch of the Anti-Tuberculosis Society. Much credit is due to the late Dr. S. R. Jenkins for the valuable assistance and advice which he gave to the organization and for his subsequent untiring efforts, through the Society and through the Canadian Red Cross Society, to secure better health measures for the people of the province.

Through the efforts of the Anti-Tuberculosis Society support was obtained for meat and milk inspection by local communities. In Charlottetown recommendations were forwarded to the city council relating to meat and milk inspection and urging the construction of a civic abattoir. Although not immediately successful, public opinion was created which resulted in 1921 in providing meat and milk inspection and the construction of an incineration plant. The need for sanatorium accommodation was also stressed. It was not possible, however, to obtain Government support for the erection of a suitable institution. The movement therefore gained a great impetus when Charles Dalton, who later became Lieutenant-Governor, made possible by a generous gift the erection of a sanatorium. This institution was opened in March, 1915, with Dr. Garrison as superintendent. During the Great War the Federal Government used the Dalton sanatorium and increased its bed capacity several times. At the conclusion of the war the Anti-Tuberculosis Society found itself embarrassed with the large building and in April, 1921, urged the restoration of the building in accordance with the original plans.

THE WORK OF THE PROVINCIAL RED CROSS SOCIETY

Following the war, in accordance with the enlarged commission of the International Red Cross Society as contained in the Treaty of Versailles, the Canadian Red Cross Society, through its provincial branches, offered assistance to the Provincial Governments and to national voluntary agencies interested in public health. In December, 1920, following a meeting called by the provincial Red Cross Society, a child welfare section was formed. This marked the introduction of organized child welfare work in the province. Miss Amy McMahon, an overseas army matron and nurse of wide experience in child welfare work, was appointed and commenced a programme of public health nursing. This was the beginning of infant, maternal and child welfare work; of the inspection of children in the Charlottetown schools and later in the rural schools; of nurses' visits to the homes; of public lectures; and of the establishing of Junior Red Cross branches in the schools.

The need for a provincial health department, for which legislation had been enacted, was appreciated by those who were cognizant of the health situation. In 1922, and again in 1923, the executives of the Red Cross Society approached the Provincial Government urging the creation of such a department, but without success. Appreciation, however, of the work being conducted by the Society was evidenced in 1924 by the establishment of an annual provincial grant to the Society to carry on its programme, which had been financed largely by the national headquarters of the organization.

In 1923 Miss McMahon resigned and was succeeded by Miss Mona Wilson. With demands for increasing service, additional nurses were appointed. School medical and dental services were provided and efforts were made to effect the sanitary improvement of the school buildings. Dental and tonsil clinics were held and clinics for the examination and treatment of crippled children inaugurated. Through the efforts of the Red Cross Society,

vaccination against diphtheria and smallpox was conducted and instruction given in home nursing, the care of infants, and in first-aid.

During this period the Canadian Tuberculosis Association again demonstrated its willingness to assist in meeting the problem of tuberculosis. Although the public were conscious of the very high death rate from tuberculosis and in the earlier years the Anti-Tuberculosis Societies had been highly effective in disseminating knowledge of the disease, no provision had been made by the Government or any agency to make possible the earlier diagnosis of cases, their hospitalization, or the supervision of contacts.

In July, 1922, Dr. R. E. Wodehouse, then executive secretary of the Canadian Tuberculosis Association, accompanied by the late Dr. J. W. Robertson, then chairman of the Canadian Red Cross Society, visited Prince Edward Island and addressed meetings in Charlottetown and Summerside, outlining a programme of co-operation by which an adequate tuberculosis control programme could be conducted. Hope was expressed of obtaining the amount of \$100,000 to make immediately possible the fulfillment of the plans. Although these funds were not obtained, the work was undertaken and brought to a successful conclusion in 1931 with the establishment of a provincial health service by the Government.

Bovine tuberculosis was not neglected. Through the services of the Federal Government the testing of all cattle in the province was undertaken in 1923 and completed in 1925. Prince Edward Island was the first province in Canada to be declared a tuberculosis-free area in respect to cattle.

A province-wide chest diagnostic survey was undertaken in July, 1925, by the Canadian Tuberculosis Association in co-operation with the Provincial Medical Association and the Red Cross Society. This was made possible by the co-operation of the Department of Health of Ontario in making available the services of the director of its travelling chest clinic, with his associate and the necessary X-ray equipment. Visits were made to nine centres and 189 cases were examined. This survey emphasized the necessity of providing a permanent diagnostic service and adequate sanatorium facilities.

Prince Edward Island was not alone in having an unsolved tuberculosis problem. New Brunswick and Nova Scotia were also facing similar needs. In 1925 a conference was held in Kentville, N.S., of physicians particularly interested in tuberculosis with representatives of the Provincial Departments of Health. The major findings of the conference were contained in a resolution urging that a special educational programme be instituted in the three provinces if money could be obtained. Through the co-operation of the Canadian Life Officers' Association these plans were made possible and the Maritime Tuberculosis Educational Committee was organized in 1926. The demonstration as planned by the committee was to continue for a period of five years. As a result of the years of educational effort in Prince Edward Island public support was at once accorded the plans for a permanent programme. It was indeed pleasing that a provincial sanatorium containing fifty beds was planned, constructed and opened in the city of Charlottetown before the termination of the five-years' demonstration. The participation of the

Canadian Life Officers' Association in the whole project of providing effective tuberculosis control in the Maritime provinces has proved to be one of the most valuable contributions which the life insurance companies have made to organized public health.

The committee made available the services of Dr. G. J. Werrett, who undertook to conduct diagnostic clinics twice yearly, and made possible also tuberculosis follow-up work by the Red Cross nursing staff. These arrangements were continued until the appointment, in November, 1928, of Dr. P. A. Creelman as diagnostician for Prince Edward Island. Dr. Creelman was at the same time appointed the first chief health officer for the province to serve in a full-time capacity.

Before the conclusion of the demonstration the Government announced the formation of a department of health, with the appointment of the Hon. Dr. W. J. P. MacMillan as the first minister of public health. Dr. B. C. Keeping was appointed chief health officer. Dr. P. A. Creelman was appointed medical director of the sanatorium and in charge of the tuberculosis programme of the province. Public health laboratory facilities have been provided in the sanatorium. The nursing personnel employed by the Red Cross Society were appointed to the staff of the department and an effective organization has been provided. To permit of the assumption of these new responsibilities by the Government, the continued co-operation of the Canadian Life Officers' Association for a further period of five years was arranged, the Provincial Government and the city of Charlottetown assuming 50 per cent of the budget of the new department.

The evolution of the Department of Health has indeed been gradual, but it rests on the firm foundation of public opinion created by the untiring efforts of many of its public-spirited citizens. The accomplishments of the past three years are rich in promise for the future.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA* BY PROVINCES—SEPTEMBER, 1934

Diseases	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Mani- toba	Saskat- chewan	Alberta	British Columbia
Diphtheria.....	2	4	18	60	16	24	44	3	6
Scarlet Fever....	0	30	14	234	207	74	28	13	88
Measles.....	0	6	0	139	53	70	73	5	1
Whooping Cough.....	0	10	1	653	432	60	314	14	91
German Measles..	0	2	0	5	11	1	0	1	2
Mumps.....	0	0	0	25	112	7	11	0	34
Smallpox.....	0	0	0	0	0	1	1	0	0
Cerebrospinal Meningitis.....	0	0	0	2	2	1	0	0	1
Anterior Poliomyelitis...	0	0	1	36	130	1	2	2	9
Typhoid Fever....	1	3	18	126	117	9	11	12	11
Trachoma.....	0	0	0	1	0	0	0	0	33

*Data furnished by the Dominion Bureau of Statistics, Ottawa.

Housing in Montreal*

AIME COUSINEAU, C.E.

Sanitary Engineer, Department of Health, Montreal, Quebec

EVERY large city has its own housing problem. It manifests itself when the number of dwellings does not correspond to the demand or when the conditions of habitation are such as to be a menace to the population.

Good housing, which is a prophylactic measure, can be obtained by providing, among other things, proper sanitation and well lighted and ventilated rooms, opening on air spaces of sufficient dimensions, with due regard to their proper orientation. There are scientific reasons for demanding ventilation, natural or, in certain cases, artificial, which in its broad meaning involves certain physical characteristics such as temperature, humidity and air movement, and requires the adjustment of the indoor air environment to meet the requirements of comfort and health. The number of occupants is usually fixed in proportion to the cubic feet and the floor space of a room; this, although an imperfect means of control, is the best known means to prevent overcrowding of dwellings. It is also generally agreed that well lighted dwellings offer an excellent means of fighting tuberculosis, as the sun's rays destroy tubercle bacilli and other dangerous germs.

The influence of environment¹ from the twofold points of view of overcrowding and congestion needs also to be considered; these two terms are not synonymous but are often misunderstood. The adoption of certain arbitrary figures is often confusing if one bears in mind that in certain locations, where the density of population or the number of persons per acre or square mile is very low, health conditions leave much to be desired, while, on the other hand, in the highly congested districts occupied by hotels and large apartment houses, living conditions are usually good and there is no overcrowding.

In a word, congestion should not be determined by the number of persons living in a given space, but rather by their distribution in this space. If overcrowding can be avoided by the proper application of certain regulations and by adequate housing, congestion in large cities seems to be inevitable. The population, being unable to spread out, piles itself up in dwellings placed one upon another.² The development of cities, however, and the laws that appear to govern the distribution of population tend to obviate overcrowding and, to a certain extent, congestion. In the beginning the central nucleus of a community exercises, without restriction, a power of attraction that brings all the activity towards it; but after the central congestion has reached a certain stage it decreases and attraction is in the opposite direction. In mechanics we should say that the reaction of centrifugal forces follows the reaction of centripetal forces, and thus the zone of suburban dwellings tends to increase with the extension of the means of communication.

*Presented before the Public Health Engineering Section at the Twenty-third Annual Meeting of the Canadian Public Health Association, Montreal, June, 1934.

The subject of housing is frequently discussed at conventions of town planners, sociologists and sanitarians, but its study cannot be complete without an historical review of the problem. To this end, I shall attempt to summarize, as briefly as possible, what has been done in England, in the United States and in Canada in the last century.

HOUSING IN ENGLAND

In England, according to Wood,² the period of 1850-1870 was that of discussion and awakening, and the period 1870-1890 that of regulatory legislation, slum clearance and housing by philanthropic foundations, etc. During the following 20 years, 1890-1910, the struggle was between private initiative and local authorities, urban, rural and county. Private capital was found to be unequal to the task and government loans to private societies or to public authorities were sought.

Between 1910-1914 housing by local authorities made vast strides in Great Britain. To private initiative, however, can be attributed the housing of working classes in cottages set among gardens, and not in tenement houses.

Post-war housing was taken care of by the Housing Act of 1919 with subsidy provisions. Only half the programme of half a million dwellings was actually carried out and 174,000 of these were built by local authorities. These dwellings were of very high standard in hygiene, comfort and beauty.

Next came the Act of 1923, a new subsidy law. The amount of subsidy to local authorities did not permit, without increased rents, the housing standard of 1919.

The 1923 Act was also designed to encourage the private builder to build small houses and resulted in a marked increase in home ownership. More than 400,000 homes were then built, including 70,000 workmen-class houses by local authorities.

In 1924 the first Labor Ministry added to the 1923 Act by providing additional subsidy to allow building according to the high standards of the 1919 law. Over 366,000 houses were built in the following years to 1931 under the provisions of the 1924 Act. The same Ministry also elaborated a 15-year programme for the building of 2½ million homes by 1940.

Altogether, in the ten-year period ended in 1930, over a million subsidized or "assisted" houses were built in England and Wales and over 100,000 in Scotland, taking care of one-eighth of the population,³ but since the war nearly 2,000,000 new homes of all kinds have been built by all agencies, providing accommodation for one-fifth of the population of England and Wales.⁸

The Housing Act of 1930⁴ seeks to extend the rural housing and slum clearance and it is estimated that 100,000 persons a year will be relocated.

It is to be noted here that under the Public Health Acts a local authority may require the abatement of a nuisance in respect of housing conditions, and the responsible owner can comply with the requirements of the law simply by repairing the injurious condition. Under the repair provisions of the 1930 Housing Act, the owner may be called upon to take the necessary steps to stop deterioration and render a house fit for habitation, in default of which

closure and demolition may be required. Under certain conditions the local authority can do the work and recover expenses as a civil debt under legal procedure.⁵

In spite of the intensive efforts made in Great Britain and the expenditure of millions of pounds, the housing problem is still unsolved, according to C. K. Millard,⁶ Medical Officer of Health for Leicester, who believes that the housing problem to-day is essentially the problem of housing the poor, among whom are included the unskilled labourers with dependent children. It is essential that rental should not be beyond their means. James P. Orr,⁷ late Director of the London County Council, is also of opinion that the poorer classes have not been sufficiently considered in the post-war housing campaign, except in the slum clearance schemes which covered only a small fraction of the real slums, particularly in London, where the conditions of overcrowding continue to exist.

An example of overcrowding is the fact that there still were in England and Wales, in 1933, 98,000 families of five or more living in two rooms or less. There were also 23,000 dwellings of 3 rooms or less occupied by 3 or more families.⁸

HOUSING IN THE UNITED STATES

In the United States the situation may be summed up, according to Wood,⁹ by saying that in 1917 one-third of the American families were living in good homes, and one-third in fair homes, more or less lacking in conveniences, but not unwholesome; while remaining one-third occupied the oldest and worst cast-off houses which no one else wanted.

The housing shortage after the war made the situation worse, enlarging the group which suffered. The subsequent period of intensive building brought it back to the so-called normal, but the post-war situation again exists.

Efforts to meet the housing situation in the United States, according to the same author, were of two main types, "restrictive" and "constructive". The regulatory laws and ordinances which set a minimum standard of light, air, sanitation and safety were of the first type; under the second heading must be classed employers' housing and the houses erected by limited dividend companies. The total housing produced by this group, however, was negligible in comparison with the great volume provided by private business enterprise.

The New York Tenement House Law has been the American prototype of restrictive legislation which concerned the worst habitations ever devised for human habitation.⁹ The New York tenement types were constituted by a series of rooms in a row with only the end one opening to the outer air, the rest having no sunlight and no ventilation, except from a narrow well only a foot or two wide; they had only one toilet on a floor shared by several families. These tenements soon degenerated into slums and added to the problem of overcrowding and congestion.

It was soon realized how the lack of housing would hamper the expansion of war industries and in 1917 the Council of National Defence, which had been created a year earlier, appointed a sub-committee on housing. Subsequently Congress appropriated 175 million dollars at different intervals for

this purpose. The approximate number of persons housed by the war housing organizations was 138,000.

The progress inaugurated by the United States Government's high standards in war housing was wiped out by the post-war years of housing shortage, accompanied by congestion, lack of repairs and generally lowered standards.⁸

To cope with the building problem, the rehabilitation projects of blighted areas, suggested by the New York Regional Plan Association,¹⁰ may be used to illustrate an example of practical procedure for conducting re-building operations and modernization of existing houses. It has been recognized by the Association that blighted areas, aside from their objections from the health point of view, are becoming less profitable to the city, the general public and the owners of its real estate. Depreciation having set in, the areas are becoming a liability rather than an asset, and if these conditions are allowed to continue the "slum" stage is reached and the section, with lowered health, morality and living standards, becomes undesirable both economically and socially.

Mr. Lawrence Veiller¹¹ has suggested an effective slum clearance programme (applicable for the rehabilitation of blighted areas) in a memorandum submitted as an appendix to the report to the President's Conference on Home Building and Home Ownership, which he summarizes as follows:

1. A definite policy.
2. Legal power to proceed.
3. A special "authority" to do the work.
4. Fair basis of compensation.
5. A use of the cleared area in harmony with the law, with public policy and with the city's master plan, and
6. A sharing of the cost that will not make such schemes prohibitive.

Without considering its financial aspect, it is also interesting to cite the housing bill,¹² written to the specification of President Roosevelt, which is now being considered by the United States Government. The proposed legislation is directed towards the modernization of existing houses that are worth the costs, the stimulation of new home construction that can be justified economically, the demolition of obsolete construction by discouraging repair of such structures and encouraging new construction and, finally, the repair and replacement of industrial structures.

HOUSING IN CANADA

In a monograph prepared by Mr. A. D. Dalzell on "Housing in Canada"¹³ it is admitted that a large proportion of Canadian citizens are fairly well housed but that there is a potential danger that the evils of housing in the older countries may be repeated in Canada.

Mr. Dalzell calls especial attention to the buildings used as dwellings by the working classes, the character of which is affected by economies made necessary by excessive land and development costs.

An important housing project was sponsored by the Federal Government in 1918 to meet the conditions created by the practical cessation of building operations during the war which brought a great scarcity of housing accom-

modation in most Canadian cities. Without going into the details of this project, let us note that the total amount loaned to the provinces between 1918 and 1924 was 23½ million dollars, of which approximately 9 1/3 and 7 1/3 millions were advanced to the provinces of Ontario and Quebec, respectively. A revote of 4 million dollars was approved by Parliament for the final year, 1923-24.

The total number of houses erected under this Act was 6,244 in 179 municipalities. As far as the province of Quebec is concerned, this housing scheme has not given the results contemplated by the Federal authorities. I have no available information on the results of this undertaking in the other provinces of the Dominion.

No reference towards the solution of the housing problem in this country can be made without noting the excellent work achieved by the Commission of Conservation and the Town Planning Institute of Canada, which organizations, we regret, are no longer in existence.

HOUSING IN MONTREAL

In considering the housing problem it is desirable first to review the growth of the city and its main tendencies. In this respect no better illustration can be offered than that given in a paper by Professor Dawson,¹⁴ "The City as an Organism", in which he represents the successive zones of the expansion of the city as circles developing radially from the centre. Montreal's development resembles a series of concentric ovals rather than circles, the expanding city territory having been squeezed between the St. Lawrence and the Mount Royal. The main tendencies, however, hold true. The central zone is the financial and political centre of the city, but not the geographic centre; it includes retail and wholesale stores; it is the centre of local and outside transportation, with its railroad stations, its great hotels, its theatres, its departmental stores, etc. This central area is characterized by high land values and great mobility of population.

In the second zone the demands made on the central area cause its invasion by light manufacturing and business; hence the relatively high land values and the relatively low rentals. The sites are held speculatively for prospective business requirements; dwellings are allowed to deteriorate and are occupied by a changing population, including immigrants.

The third zone is occupied by the working classes who have escaped from the second zone or who have been disturbed by further deterioration in the area of former residence. The fourth area is that of exclusive residences and apartments, while the fifth lies in the suburbs.

Distribution of Population

According to the 1931 census the population of Montreal is 818,577, distributed in 35 wards covering a total area of 46.75 miles or 29,823 acres. With the portions of the St. Lawrence and Des Prairies Rivers in the city territory included, the total area is 50.24 square miles or 32,155 acres.

TABLE I

AREA IN ACRES, POPULATION, DWELLINGS AND MORTALITY RATES BY WARDS
MONTREAL, 1931

Ward	Area in acres		% of built-up lots	Population		Dwellings		Mortality	
	Total	Parks (a)		Total	Per acre	Total	No. of persons per dwelling	General death rate per 1,000	Tuberculosis per 100,000
Ahuntsic.....	4178.13	1.38	10.4	19,490	4.6	3,047	6.4	7.6	92.5
Bourget.....	173.42		95.5	24,100	139.0	5,490	4.4	12.7	132.5
Cremazie.....	142.01	3.3	98.0	17,234	121.0	3,247	5.3	7.9	81.2
DeLorimier.....	408.72	8.98	89.5	42,800	105.0	9,895	4.3	11.2	100.4
Hochelaga.....	254.53	.8	90.2	22,009	86.5	4,483	4.9	13.9	168.0
Lafontaine.....	194.55	95.0	83.4	9,856	50.7	2,393	4.1	11.6	101.5
Laurier.....	133.45	1.1	99.0	16,078	120.0	4,479	3.6	10.8	106.0
Maisonneuve.....	857.6	228.5	58.0	30,167	35.1	6,371	4.7	10.6	96.6
Mercier.....	4572.52	32.26	13.85	20,397	4.4	3,298	6.2	9.4	78.5
Montcalm.....	564.05		35.8	16,458	29.2	3,755	4.4	10.7	97.0
Mount Royal.....	2413.24	1.9	18.6	11,898	4.9	2,431	4.9	8.1	42.1
Notre Dame de Grace	2918.65	31.77	40.0	46,850	16.0	13,283	3.5	7.0	44.9
Papineau.....	161.43	4.84	95.0	15,770	97.8	3,486	4.5	13.7	101.5
Prefontaine.....	718.77	16.0	44.2	19,444	27.1	4,210	4.6	11.3	56.5
Rosemont.....	2019.76	262.3	26.4	44,534	22.1	9,223	4.8	10.3	119.0
St. Andrew.....	1051.77	483.23	86.5	23,424	22.3	6,868	3.9	9.4	81.0
St. Ann.....	711.97	5.40	89.5	16,860	22.7	3,415	4.9	11.0	41.5
St. Cunegonde.....	247.68	.3	92.5	18,650	75.4	4,253	4.4	12.9	128.0
St. Denis.....	282.51	26.57	88.8	24,774	87.5	5,683	4.4	10.7	85.0
St. Edward.....	355.61		88.5	33,434	94.3	7,735	4.3	12.0	110.5
St. Eusebe.....	311.66	7.68	64.5	20,671	66.5	4,653	4.4	10.8	126.0
St. Gabriel.....	386.45	17.0	82.0	19,873	51.5	4,389	4.5	12.1	121.0
St. George.....	422.57	8.70	94.5	13,481	31.8	3,800	3.5	11.7	103.5
St. Henri.....	411.02	14.04	87.5	29,791	72.4	6,364	4.7	12.4	114.0
St. James.....	176.28		99.4	22,833	129.5	4,992	4.6	14.7	210.0
St. John.....	668.85	2.00	40.7	18,278	27.3	5,743	3.2	15.9	148.0
St. John Baptist.....	229.97	.37	99.5	31,579	138.0	6,773	4.7	11.1	85.5
St. Joseph.....	185.99	3.31	80.5	10,855	58.4	2,265	4.8	15.7	138.0
St. Lawrence.....	162.00	2.2	96.5	20,545	126.5	4,801	4.3	9.3	136.5
St. Louis.....	235.58		98.5	17,627	75.0	4,835	3.7	17.0	130.5
St. Mary.....	315.63	4.54	19.4	14,809	47.1	2,808	5.3	13.2	115.0
St. Michael.....	264.26		95.4	25,582	96.5	6,204	4.1	7.6	31.3
St. Paul.....	1255.64	125.22	48.5	27,840	22.2	5,666	4.9	10.2	93.0
Ville-Marie.....	375.45	13.64	91.7	10,236	27.3	1,617	6.3	10.7	117.2
Villeray.....	2061.53	108.31	53.5	60,350	29.2	12,497	4.8	9.6	86.0
Total or av. for the city.....	29823.3	1510.64	46.0	818,577	27.4	183,920	4.4	12.16	108.0

(a) Data concerning playgrounds not included in parks.

The general average density per dwelling for the city, or the number of persons per dwelling, is 4.4 for 1931; this varies between 3.2 and 6.4 for the different wards.

If we compare the density, or the number of persons per acre, and the corresponding mortality rates for each ward, we find that the wards of low density generally have comparatively low mortality rates. The same correlation cannot be made, however, if we consider the number of persons per dwelling instead of the number of persons per acre. The maximal and minimal figures presented in Table II will illustrate this statement.

TABLE II

NUMBER OF PERSONS PER DWELLING, DENSITY OF POPULATION, AND MORTALITY RATE
ACCORDING TO WARDS

Ward	No. of persons per acre	No. of persons per dwelling	Mortality per 1,000
Ahuntsic.....	4.6	6.4	7.6
Mercier.....	4.4	6.2	9.4
Mount-Royal.....	4.9	4.9	8.1
Bourget.....	139	4.4	12.7
St. James.....	129.5	4.6	14.7
St. John Baptist.....	138	4.7	11.1

When making similar comparisons for 1920 in a previous paper,¹⁸ we found that several wards of low density (number of persons per acre) had relatively high mortality rates. It would appear, therefore, that with the improvement of sanitary conditions in these wards and with a wider knowledge of the principles of hygiene, this paradox no longer holds*.

The following table makes possible a comparison of occupancy between the years 1920, 1931 and 1933.¹⁵

TABLE III

OCCUPANCY OF DWELLINGS IN MONTREAL
1920, 1930 and 1931

Population	1920 700,000 (estimated)	1931 818,577 (census)	1933 847,000 (estimated)
Number of dwellings.....	127,901	183,920	189,446
Houses occupied by owners and tenants.....	37,876	46,297	47,951
Houses occupied by owners only.....	6,744	8,743	8,603
Houses used for business and living purposes.....	8,715	9,784	9,689
Buildings used for stores or offices.....	4,642	4,076	4,118
Vacant dwellings.....	705	8,091	13,235
Vacant store or offices.....	679	3,224	4,546

Housing Control

To prevent insanitary dwellings in Montreal two efficacious means have been applied:

1. Suitable legislation.
2. Effective organization of the public services, especially those having the control of building construction and occupation.

Provincial By-laws

The complete revision in 1924 of the provincial by-laws relating to dwell-

*For the five-year period 1884-88 the general death rate per 1,000 was 30.9 for an average population of 180,951; for 1920 the rate was 17.6; for 1931, 12.1; 1932, 11.7; and for 1933, 10.6. The proportion of deaths of infants under one year per 1,000 live births, which was 159.4 in 1922, was reduced to 98.6 in 1933. The tuberculosis death rate per 100,000 population, which was 308.0 for the five-year period 1886-90, has decreased from year to year, falling to 96 per 100,000 in 1933. The tuberculosis death rate for the province of Quebec was 102 per 100,000 in 1932 and the latest available rates (1929) for Baltimore, St. Louis, Boston and Cleveland, cities of about the same population as Montreal, are 108, 96, 79 and 97, respectively.

ings in general has been a great step forward in house sanitation. As the existing city by-laws were less efficient or did not meet the minimum requirements of the provincial legislation, the provincial by-laws have force of law in Montreal, according to the terms of Quebec Public Health Act. From the public health point of view this legislation is of the greatest importance and concerns the architect, the builder, and the municipal authorities who are responsible for its enforcement.

The provincial by-laws relating to dwellings in general stipulate, among other things, that no building shall occupy more than 75 per cent of the area of an interior lot and not more than 90 per cent of the area of a corner lot. They provide for minimum dimensions for rear yards and for outer and inner courts in proportion to the height of buildings, etc. Concessions are made for areas classified by the municipal authorities as commercial or industrial, within which the different requirements regarding open spaces, etc., apply only to dwellings.

In addition to the above requirements, we have in the province of Quebec the Civil Code restrictions (sections 533 to 538) which are of great help, in certain cases, in assuring the execution of the above by-laws relating to dwellings. They concern the views on adjoining properties. Section 536, for example, reads as follows:

"One neighbour cannot have direct views or prospect windows, or galleries, balconies or other like projections overlooking the fenced or unfenced land of the other; they must be at a distance of six feet from such land."

City Regulations

The regulations governing the construction of buildings in Montreal depend on a special service known as the Building Inspection Department which has the necessary authority to enforce building regulations. No building or alteration permits, however, are granted unless they are approved by the Department of Health. Furthermore, the Department enforces a plumbing code requiring licensing of plumbers, inspection and tests of piping, etc. as well as several other by-laws for the protection of public health and sanitation.

In addition to supervising the construction of new buildings or the alteration of others, the municipal sanitary authority is compelled by the Quebec Public Health Act to visit, from time to time, all buildings within its territory, in order to discover insanitary conditions that may exist therein or about them. As shown by the statistics which follow, this inspection of dwellings, stores, schools, public buildings, factories, etc., is made regularly and systematically.

Special attention has been given in the last decade to the inspection of dwellings in connection with the establishment of a "Housing Sanitary Record System". A card record is prepared for every dwelling as to its general sanitary condition: window openings, open spaces, plumbing and drainage, causes of dampness, state of repair and cleanliness, system of heating and artificial lighting; the occupation of dark rooms or rooms not directly lighted to the outer air, and the occupation of cellars or basements having more than

half their height below the level of the adjoining ground. Dwellings the occupation of which should not be tolerated are specially noted.

Dark Rooms

The occupation of dark rooms is considered as a nuisance by the Quebec Public Health Act and can be dealt with as such. The law also provides for the placarding of such rooms and a penalty for the removal of notices which read as follows:

"THIS ROOM, HAVING NO WINDOWS OPENING DIRECTLY OUTSIDE
THE BUILDING, CANNOT BE USED FOR EITHER DAY
OR NIGHT OCCUPATION"

This restriction is to prevent the occupation of windowless rooms and their being included in the number of inhabited rooms when dwellings are rented.

For a great number of years rooms not lighted directly from the exterior have neither been permitted nor tolerated, the city and provincial by-laws having been enforced by the competent authorities. Unfortunately, the lack of sanitary supervision in most of the municipalities prior to their annexation to the city of Montreal has developed conditions which have demanded our continued intervention.

Although the existing by-laws require that every room must have a window measuring at least one-tenth of the floor area, double rooms are permitted provided that there is an 80 per cent opening between the rear room and that provided with a window. This concession in the provincial by-law, which has been allowed owing to the insufficient width of building lots, has led to many abuses, such as the installation of doors or heavy curtains in the required 80 per cent opening.

Present Housing Conditions

By the end of 1933 the survey in connection with the establishment of the sanitary record system of dwellings had enabled the Health Department, through educational and persuasive work, and without having to resort to coercive measures, to effect the sanitary improvement of nearly 70 per cent of the dwellings recorded as having dark rooms—a total of 7,000. To this number should be added about 3,000 rooms which were placarded and the occupation of which was forbidden. In addition, 1,086 insanitary dwellings, mostly cellars, of which 345 have been vacated, have also been recorded. This work has been an important factor also in preventing the existence of these defects in new buildings.

The first survey completed in 1929 and the statistics by wards¹² suggest comparisons of a general order which are summarized for the whole city as follows:

1. In the different dwellings inspected it was found, on the average for the ward, that there was a room per person, except in two wards (Mount-Royal and St. George) which had $1\frac{1}{2}$ rooms per person. This indicates that at that time the city dwellings were not overcrowded. No statistics are available for 1933, but it is probable that, owing to the unemployment situation, this condition has changed somewhat.

2. At the end of 1929, out of a total of 141,877 dwellings recorded, 8,329 or about 6 per cent had one room not lighted directly to the outer air. As stated above, 70 per cent of such rooms had been improved by the end of 1933. These figures do not include toilet rooms, of which 38 per cent in 1929 were not lighted directly to the outside air. Nearly all were ventilated and in several cases borrowed light was provided in addition. It is estimated that the latter percentage had been reduced to 29 by the end of 1933.

3. Almost all the houses in the city are connected with public sewers. Less than one-third of 1 per cent of the dwellings have temporary means of sewage disposal. Such dwellings are located chiefly in the suburbs.

4. All the dwellings are supplied with running water from the municipal system. Ninety-six per cent of the milk consumed in the city is pasteurized and the remaining 4 per cent is either special or certified milk. The typhoid death rate for the five-year period 1876-80 was 59.7 per 100,000; for 1901-05, 31.7; for 1910-20, 16.1; for the year 1932, 4.4; and for 1933, 3.7.

General Observations

The sanitary recording of dwellings provides an inventory of the average existing housing conditions for the years 1921-29, and not for 1929 or any other particular year in this period. This work, which has been conducted by the regular inspection staff in addition to the routine work, has enabled us to make general observations, which may be summarized as follows:

In most of the city wards houses are built next to each other on lots the depth of which is about four times their width. These houses are provided with outside stairs, which obstruct natural light and are objectionable also for aesthetic reasons. On the other hand, they provide a separate entrance for every dwelling.

Although not ideal and not conforming to the standard of houses lighted on three sides or of cottages, the prevailing type of construction in Montreal is to be preferred to the "tenements" so common in certain urban communities, or buildings occupied by 15 or 20 families, with all the evils of dark corridors, stairs, etc.

Houses in Montreal are generally of 2 or 3 storeys, with a corresponding number of dwellings. During the past few years, however, there has been a tendency to erect 5 or 6 dwellings on the ordinary 25 to 30 foot lot and this innovation has given rise to a real abuse, particularly in the width of space allowed to a room and the lack of light and air. This type of construction has proved unsatisfactory, not only from the sanitary point of view but from the economic point of view as well, as tenants rarely stay more than a year or two. One of the main objectionable features in our workmen's dwellings is the so-called double room referred to above, which can hardly be avoided with the existing land subdivisions. Fortunately, cellar occupation is not a problem in Montreal, as comparatively few dwellings are thus occupied and are to be found chiefly in residences converted into several small dwellings.

Detached, semi-detached, and apartment houses offer no difficulty, but their conversion into several small apartments requires strict supervision to keep them up to the standard of new dwellings.

Montreal has not, for the time being, a shortage of dwellings. In 1933 there were 13,235 vacant dwellings and 4,546 vacant stores and offices, compared with 695 and 679, respectively, in 1920.¹⁵ A yearly average of 6,500, or 52,215 dwellings has been built between 1922 and 1929, and 11,518 or an average of 2,800 for the period 1930-1933.¹⁶ In the latter year only 611 dwellings were built. It is obvious that, with the return of normal economic conditions, the vacant dwellings that are fit for habitation will be occupied and that a large number of new dwellings will be required to take care of the continued increase in population.

Sanitarians and sociologists are of the opinion that the principal evils associated with bad housing are dark rooms, cellar dwellings, lack of drainage and water supply, defective plumbing, permanent dampness of walls, etc., lack of sanitary conveniences, deterioration, proximity to undesirable environment, etc. These defects may be classed as constitutional or structural insalubrity and require the intervention of the owner of the properties concerned. There is, on the other hand, the acquired insalubrity that may bring slum conditions but which depends mainly on the tenants of the premises concerned, and can be controlled by education and the proper application and observance of sanitary by-laws or by preventing people from maintaining conditions which are primarily a menace to themselves.

The survey of housing conditions in Montreal, as corroborated by statistics published in the annual reports of the Health Department, shows that *slum* conditions are seldom found. Every dwelling has running water and separate toilet accommodation, and dark rooms (not alcove rooms) can be found in less than one per cent of the city's dwellings.

It is not to be inferred from the above that ideal conditions are to be found in Montreal and that the type of workmen's dwellings and the system of land subdivision need not be revised. Admittance of more sunlight would be desirable in these habitations and could be achieved through the prohibition of alcove or double rooms²⁰ and of outside stairs above a

certain height, and of the erection of two and three storey sheds a few feet from the rear elevation of dwellings. The more extensive use of outer, inner and through courts, with, as far as possible, provision for light on three sides of every building, is also highly desirable.

Housing Projects

Housing projects calling for large expenditures of money and having for their main objectives the relief of the present unemployment situation and the improvement of housing conditions, have lately been suggested for Montreal. Without discussing the merit or desirability of these proposals, which will be considered in due course by competent authorities, I may venture to say that, to solve the housing problem with due consideration for landlords and tenants of the labouring classes, a general plan of rational development must be devised. Ample provision for parks, playgrounds and other open spaces should be made. The establishment of zoning laws throughout the city territory, including if possible the re-subdivision of the unbuilt area, and the enacting and enforcing of building and housing regulations would prevent slum dwellings such as are to be found in certain sections of the largest cities in the world and which are the cause of disastrous conditions from both the economic and the public health points of view.

REFERENCES

- ¹Veiller, Lawrence: *Housing Reforms*, The Russell Sage Foundation, 105 East 22nd St., N.Y., 1911, pp. 27-35.
- ²Turot et Bellamy: *Le surpeuplement et les habitations à bon marché*, Felix Alcan, 108 Boulevard St. Germain, Paris, 1907, p. 11.
- ³Wood, Edith Elmer: *Recent Trends in American Housing*, Macmillan, Toronto, 1931, pp. 8, 9, 15, 16, 17.
- ⁴Ministry of Health, England: Circular No. 1331 re Housing Act 1930, Part I, *Medical Officer*, London, 15 April, 1933, p. 144.
- ⁵Fenton, James: Clearance Areas and Improvement Areas, *J. Roy. San. Inst.*, April, 1933, p. 590; Procedure under the Housing Act for Repair of Defective Houses, *ibid.*, May, 1934, p. 533.
- ⁶Millard, C. Killick: Healthy Housing for the Poor, *Medical Officer*, 18 March, 1933, p. 105.
- ⁷Orr, James P.: The London Housing Campaign, *Medical Officer*, 3 February, 1934, p. 45, and 10 February 1934, p. 55.
- ⁸Report of an address of the Prince of Wales on Slum Clearance Schemes, *Medical Officer*, 27 May 1933, p. 204.
- ⁹Thomas, J. Andrew: Cooperative Housing, *Locomotive Engineers J.*, May 1925, p. 333.
- ¹⁰McKernon, Edward: Rehabilitation of Blighted Areas, Bulletin No. 15, 27 November 1933, The Regional Plan Association, Inc., 400 Madison Avenue, N.Y.
- ¹¹Veiller, Lawrence: Slums, Large Scale Housing and Decentralization, The President's Conference on Home Building and Home Ownership, 1932, p. 47.
- ¹²Special Washington correspondence re new bill to attack housing on a new and wide front, *Engin. News Rec.*, 12 April 1934, p. 487.
- ¹³Dalzell, A. G.: Housing in Canada in relation to Land Development, The Social Service Council of Canada, 309 Metropolitan Building, Toronto 2, January 1927, p. 37.
- ¹⁴Dawson, C. A.: The City as an Organism, Special Town Planning Number of the Montreal City Improvement League, 1929, pp. 11-12.
- ¹⁵Annual Report of the Assessment Department, City of Montreal, 1931.
- ¹⁶Seventh Census (1931), Dominion Bureau of Statistics. Montreal City Bulletin XXXVIII.
- ¹⁷Annual Reports of the Department of Health, Montreal, 1929-33.
- ¹⁸Cousineau, Aimé: L'Habitation à Montreal, *Revue trimestrielle*, mars 1920, pp. 85-94. Congestion, Health and Mortality, *Canad. Engineer*, October 1921.
- ¹⁹Annual Reports, Building Inspection Department, City of Montreal, 1923-33.
- ²⁰Macdonald, R. St. J.: Health and Housing, The Social Service Council of Canada, 309 Metropolitan Bldg., Toronto, April 1929, p. 8.

Public Health Aspects of Wading Pools for Children

W. J. McCORMICK, M.D., Toronto, Ontario

DURING the last decade a generally standardized code of sanitary regulations pertaining to the operation of swimming pools has been adopted by most of the provincial and state boards of health in North America.

The salient features of this code as enforced in the city of Toronto may be summarized as follows:

- (1) The condition of the water in swimming pools must at all times be such that the bacteria per cubic centimetre shall not exceed 250, and colon bacilli must be absent in 1 cc.
- (2) The number of persons admitted in any 24-hour period shall not exceed 20 for each 1,000 gallons of clean water added to the pool in said period, while at no time shall the number of bathers exceed 3 per 1,000 gallons of total capacity.
- (3) All persons entering the pools must take a preliminary shower bath with use of soap.
- (4) Suitable dressing rooms with lavatory equipment must be maintained adjoining the pools.
- (5) At all times while the pools are in use an amount of available chlorine shall be maintained in the water within the limits of 0.2 to 0.5 parts per million.

In the city of Toronto this code of sanitation has been effectively applied to all public swimming pools, both indoors and outdoors, and a monthly check is made on all the pools by the municipal department of health. Likewise in all the leading cities of our continent similar sanitary regulations are in general effect pertaining to swimming pools proper. But, from the data obtained by the writer in response to a questionnaire sent to the leading cities of Canada and the United States, no effective sanitary code has yet been generally applied to the operation of children's wading pools which are located in many of the parks and playgrounds of our larger cities.

In *Toronto* there are 14 such wading pools in operation during the summer months. Twelve of these are operated by the Parks Department and one by the Harbour Commission. Thirteen are circular in shape, 50' in diameter, and with a depth of from 6" at the edge to 18" in the centre. One is rectangular in shape, approximately 50' x 125', the depth being 4" to 2'. In connection with this pool dressing rooms are provided, but no toilets or shower baths, although the children are permitted to wear bathing suits and use the pool for swimming. The water in this pool is changed thrice weekly, but is not chlorinated. The daily attendance frequently reaches the 500 mark in hot weather. Of the 13 circular pools 12 are restricted to wading only, the children being forbidden to wear bathing suits or to get their clothing wet. In the absence of chlorination this is a redeeming feature of the situation as

respects Toronto. In the wading pool operated by the Harbour Commission the children are permitted to wear bathing suits and get down into the water. These pools are emptied and refilled daily, but none is chlorinated, and in only four are toilets provided adjoining the pools. The average daily attendance per pool is 230.

In order to correlate the bacteriological condition of these pools, 26 samples of water were taken at various times during the summer months and submitted to the Laboratory of the Provincial Department of Health for analysis. In all but one of these specimens colon bacilli were reported present—8 being positive in 0.1 cc. and 10 positive in 1 cc. The bacterial count on 18 of these specimens was in excess of 250 per cc.—one being 1,500, two 2,000, one 3,000, one 6,000, one 9,000, and four reported as "too numerous to count"—the last five being from the two pools referred to, in which bathing suits were permitted and the children allowed to submerge.

In the city of *Montreal* there are six outdoor wading pools and sixteen indoor pools under municipal operation. The daily attendance at the outdoor pools during July and August is from 400 to 500 per pool, and the age limit is 14 years. All children using these wading pools are required to wear bathing suits, and presumably are permitted to submerge. No dressing rooms or lavatories are provided. The water is changed daily. None of these pools is chlorinated. Of the 16 indoor wading pools which are operated throughout the year, 5 are chlorinated.

The city of *Hamilton, Ontario*, operates five wading pools, 40' x 65' in dimensions, with depth range of from 6" to 18". The attendance in warm weather approximates 200 daily per pool. The age of children admitted is from 4 to 10 years. Bathing suits are permitted and children are allowed to submerge. Dressing rooms and lavatories are provided. The pools, to which a sprinkler constantly feeds fresh water, are emptied, cleaned and refilled daily, but are not chlorinated.

The city of *Winnipeg, Manitoba*, operates seven wading pools, each 50' in diameter and 20" deep at the centre. The daily attendance averages 475 per pool, and the age limit is 12 years. Bathing suits are permitted, and children are allowed to submerge. Dressing rooms and lavatories are provided, and the water is changed daily; but the pools are not chlorinated.

The wading pool situation in the leading cities of the United States is very similar to that of the Canadian cities.

The city of *Detroit* operates 8 wading pools for children. Each pool is 100' x 150', with maximum depth of 16". The attendance at these pools in warm weather is from 1,000 to 2,000 daily per pool. There are lavatories "on the grounds", but presumably not immediately adjoining the pools; and no dressing rooms are provided. The children are expected to come to the pools in bathing suits, and are allowed to submerge. The pools are emptied and cleaned daily, and a supply of inflowing water is maintained while in use. None of Detroit's wading pools is chlorinated.

The city of *Buffalo* operates 7 wading pools for children under 12 years, ranging in size from the small pool, "Lincoln", 30' in diameter, with depth of

14" to 2', to the mammoth pool, "Humboldt", 520' in diameter, with depth of 6" at curb to 3½' at centre. The daily attendance at these pools in warm weather ranges from 200 in the small pool to 9,000 in the largest. The children are permitted to wear bathing suits and submerge. The smaller pools are emptied daily, and the larger pools twice weekly. On the intervening days the larger pools are half emptied, refilled and overflowed. Dressing rooms and lavatories are provided; but none of these pools is chlorinated.

The city of *Boston* operates one large outdoor pool for children under 12 years on Boston Common. The dimensions of this pool are 130' x 430', and the average daily attendance in warm weather is 1,000. The water is changed thrice weekly, and a supply of inflowing water is maintained during the intervals. No dressing rooms or lavatories are provided, and the pool is not chlorinated.

The city of *Cleveland* operates two small wading pools for children under 10 years of age. Bathing suits or street attire is optional, with preference given to the former; so presumably the children are permitted to submerge. Although these pools are emptied daily, and a continuous inflow of fresh water is maintained, the parks department was not satisfied with the sanitary condition, and instituted a preliminary cleansing system for the bathers; but the water in these pools is not chlorinated.

The city of *Chicago* operates ninety wading pools for children up to 10 years of age. In dimensions each pool is approximately 40' x 60'. No record of attendance is kept. The children may wear bathing suits and submerge. For dressing rooms and lavatories the playground buildings are used, which may or may not be located convenient to the pools. The water is changed twice weekly, "or more if needed"; but none of Chicago's wading pools is chlorinated.

The city of *New York*, in the boroughs of Manhattan, Bronx, Queens and Richmond (data from Brooklyn not obtainable), operates 32 wading pools for children under 16 years. The dimensions range from 19' in diameter to the large rectangular pool, 140' x 165', with the average daily attendance varying from 75 in the small pool to 2,000 in the larger pools. The children are permitted to wear bathing suits and to "frolic in the water". Dressing rooms and lavatories are provided. The water is changed daily, and in some cases twice daily. After each emptying the pools are scrubbed with a strong solution of chlorinated lime, and after refilling the water is treated with a similar solution twice during the day. In the newer pools a small preliminary cleansing bath for the children's feet is provided, containing a much stronger solution of chlorine. The bacteriological condition of New York's wading pools is checked twice weekly by the local Health Department, the amount of chlorine used being regulated by the results of these tests.

The city of *Philadelphia* operates 13 wading pools for children under 10 years, or under 42" in height. The pools are 30' x 50', and the average daily attendance is 425 per pool. The use of bathing suits is permitted, but the use of the pools is restricted "as much as possible" to wading. Lavatories are provided immediately adjoining the pools. The water is changed twice daily and is chlorinated by hypochlorite of lime, the chlorine content being

maintained at 0.3 parts per million. Both the city and the state health departments check the bacteriological condition of the water.

The city of *Los Angeles* operates 25 wading pools for children under 12 years. Nineteen of these pools are operated by the Department of Playgrounds and Recreation and six are under the supervision of the Department of Parks. The daily attendance per pool runs from 50 to 200. The use of bathing suits is permitted, and the children are encouraged to submerge. The majority of the pools have no dressing rooms, but lavatories are available in the parks or playgrounds in which the pools are located. The water is changed daily and is chlorinated with a standardized solution of sodium hypochlorite, which is sprinkled over the surface of the pools thrice daily, in amounts proportionate to the size of the pools, according to a routine schedule. Apparently no constant check is made on the available chlorine content of the pools when in use. The water in the pools operated by the Department of Parks is not chlorinated, blue-stone being used in preference.

Jersey City, N.J., operates two small wading pools—one circular in shape, 30' in diameter, and the other rectangular, 40' x 80'. The combined daily attendance at these pools is unusually large—2,000 to 3,000. There is no age limit, nor is there restriction on the use of bathing suits, although the use of the pools has recently been restricted to wading. A spray foot bath is required before using the pools. There are dressing rooms with lavatory equipment "at both locations". A system of chlorination has recently been put in force, and bacteriological tests are made weekly by the local health department.

Comment

It may reasonably be taken for granted that all the non-chlorinated pools above listed would show a bacteriological condition equally as bad as, if not worse than, that of Toronto's pools, owing to the fact that no attempt is made to prevent the children from getting down into the water.

From the above it is apparent that the general sanitary practice pertaining to wading pools consists in the more or less frequent changing of the water, since in only four of the cities referred to has there been any practical attempt at chlorination. Frequent change of water, however, in the absence of chlorination, does not give protection against bacterial contagion, as evidenced by the tests made on the Toronto wading pools. Analysis of these findings also establishes the fact that the pollution is far greater in wading pools where the children are permitted to submerge than in those rigidly restricted to wading. This is obviously accounted for by the greater likelihood of excretory matter being communicated to the water in the former than in the latter; and especially is this the case in the absence of adequate lavatory equipment adjoining the pools. Furthermore, it is well recognized that in attempting to swim considerable germ-laden mucus is discharged involuntarily from the nose and mouth, and considerable water is in like manner taken into the alimentary tract.

Other factors contributing to the pollution of this type of pool are:

- (1) The usually heavy attendance in proportion to the capacity of the

pools—much in excess of the accepted standard for swimming pools, in conjunction with the absence of refiltration.

- (2) The high temperature usually attained, frequently above 90° F., owing to the relatively shallow depth, permitting greater absorption of the sun's heat and that of the bathers—a condition very suitable to bacterial incubation.
- (3) The usual absence of any preliminary cleansing or disinfection of the bathers.
- (4) The faulty personal hygiene of children generally.
- (5) The fact that a large percentage of the attendance is from the under privileged class.

These observations, together with the fact that children are more susceptible to infectious contagion than are adults, should warrant an even more exacting code of sanitation for wading pools than for swimming pools proper.

Proper Chlorination

Since many of the acute infectious diseases of childhood, such as infantile paralysis, diphtheria, whooping cough, mumps, influenza and the common cold, are communicable through the secretions of the nose and throat; and since typhoid fever and dysentery are also communicable through water pollution by intestinal excreta, it is doubly imperative that all wading pools, especially those in which children submerge their bodies, should be effectively chlorinated, no matter how frequently the water is changed. Even in the pools that are rigidly restricted to wading, as in most of Toronto's pools, chlorination should be applied, since even in these the children frequently make contact between the water and their mouths, accidentally and otherwise. The writer has observed a small child fall face downward into the water several times in succession in attempting to reach the edge of one of Toronto's pools, owing to the slippery condition of the floor of the pool as a result of algae growths. Incidentally, effective chlorination would eliminate these growths which are such a troublesome and unsightly feature of most outdoor pools.

The use of blue-stone, or copper sulphate, as a substitute for chlorine, as employed by the Parks Department in Los Angeles, is not to be recommended. While effective as an algicide, copper sulphate has little value as a germicide. On the contrary, chlorine is most effective for both purposes when applied and maintained in the right proportion.

Effective chlorination implies considerably more than the routine application of definite amounts of chlorine to the pool water at regular intervals. To be effective, the available chlorine should be constantly maintained within the limits of 0.2 to 0.5 parts per million at all times while the pool is in use. And since there are many factors which modify the depletion of the chlorine, such as sunlight, the temperature of the water, the amount of organic dirt brought into the water by the bathers, and the agitation of the water, it is important that a frequent check be made on the chlorine content of the pool water—at least twice daily. Fortunately, for this purpose a very simple yet sensitive chemical test is available—the orthotolidin colour reaction, whereby the pool operator can readily regulate the chlorine treatment to comply with

these fluctuating demands. Experience has shown that in the absence of such regulation an otherwise carefully applied chlorination routine may frequently become grossly inefficient, owing to rapid fluctuation of the above mentioned factors which modify chlorine depletion.

In this connection it may be of interest to note that during July and August last there occurred in one of the cities referred to an epidemic of bacillary dysentery which attained considerable proportions, most of the cases being young children, and resulted in a number of deaths. An investigation by the State Health Department "did not result in the discovery of the source of infection". As part of the writer's general survey a questionnaire regarding operation of wading pools was sent to the Parks Department of the city in question in August last. Failing response, repeated requests were made to the Parks Department, Health Department, Director of Recreation, and finally to the mayor of the city, which in October last elicited the information disclosed in a previous paragraph. In the meantime a request had been made to the State Health Department for the desired data regarding local wading pools, which were promptly supplied, based on a survey made in 1933. "From the questionnaire sent out by this department during the above mentioned survey it were concluded that no strict or regular bacteriological control was maintained", there being no method of chlorination applied at that time. It was therefore apparent that a radical change in operative control of wading pools had been instituted during the past season; but in spite of further requests for information the writer has been unable to determine whether this change was made prior or subsequent to the epidemic of dysentery. However, in view of the unusually heavy attendance reported in proportion to the size of the two pools—2,000 to 3,000 daily, with combined surface area of less than 4,000 sq. ft.—and in the absence of any check on the daily chlorine content, it is conceivably possible that the local wading pools may have contributed to the spread of the epidemic.

Of all the cities referred to in this survey, Philadelphia is apparently the only one employing a constant check on the chlorine content of wading pools, an effort being made to maintain this at 0.3 parts per million, which should provide satisfactory bacterial protection. The method of chlorination employed by New York City and Los Angeles involves the application of a definite quantity of chlorine in each pool at stated intervals during the day. This routine plan, while laudable, is open to the objection that it is not sufficiently elastic to meet the varying demands of fluctuations in attendance due to weather and peak load periods, unless regulated by frequent chemical tests of the chlorine content as previously described. The weekly bacteriological check by the health department, while commendable, is inadequate as the sole means of regulating chlorination technique.

The cost of chlorination as applied to the average outdoor wading pool is insignificant compared to the health protection afforded the community. The method of application is also very simple. A concentrated solution of sodium hypochlorite, containing 12 per cent of available chlorine, is sold in Toronto at 32c. per gallon. One half gallon of this solution, diluted in a barrel of water and sprinkled over the surface at regular intervals, would

effectively chlorinate the average Toronto wading pool for 24 hours. Two pounds of chloride of lime with a chlorine content of 30 per cent would accomplish the same result at half the cost, but with a little more labour. In general, one pound of available chlorine will effectively chlorinate for public swimming purposes about 25,000 gallons for 24 hours. This amount can be materially reduced if effective refiltration is applied in conjunction with chlorination. This combined method should be the ideal objective for all wading pools, especially for those that are not restricted to wading, but in the meantime chlorination at least should be imperative. All wading pools in which children are permitted to wear bathing suits and submerge should be forced to comply with the full code of sanitation as applied to swimming pools generally.

Based on the above observations the following constructive suggestions are submitted:

- (1) All wading pools, unless provided with standard swimming pool equipment, should be rigidly restricted to wading.
- (2) A wire fence, at least three feet in height, should completely surround the pool, with entrance and exit gates controlled by one-way turnstiles.
- (3) A suitable administration building of light construction should be provided adjoining the pool at the entrance to same, with adequate lavatory equipment for both sexes. Space for the checking of clothing and storage of sanitary supplies, and an office for the pool operator should be provided, with first-aid kit and small cot for emergencies.
- (4) A confined passage-way, with turnstile entrance, should communicate with the pool enclosure. In this passage-way a single file foot-spraying chamber, followed by a preliminary disinfecting foot bath containing 0.1 per cent solution of sodium hypochlorite, should be provided. The valve for the foot-spray may be equipped with automatic treadle control. A separate exit, with turnstile control, should provide a return passage-way to the building.
- (5) A constant inflow of fresh water, preferably in multiple jets, should be maintained while the pool is in use, and so regulated that the pool temperature does not rise above 75° F. This inflow may be utilized as a means of applying chlorine, manually or automatically. A suitably located surface overflow is also essential.
- (6) An available chlorine content of 0.2 to 0.5 parts per million should be constantly maintained in the pools while in use. For this purpose a standardized solution of sodium hypochlorite is recommended as being most suitable for manual application. The chlorine content should be checked several times daily by orthotolidin tests of the pool water.

In conclusion, the writer wishes to thank the various civic officials who have co-operated so freely in supplying the desired information, and expresses the wish that these observations may result in improved sanitation in this much neglected field.

Government Control of Veterinary Biological Products

GEORGE HILTON

Veterinary Director General

Health of Animals Branch, Department of Agriculture, Ottawa

TO-DAY many of the infectious diseases of animals can be prevented or controlled by proper sanitation, vaccination, and by the use of sera.

While the practical application of methods based upon the knowledge of the important subject of immunity for the prevention and treatment of disease is of relatively recent origin, the employment of these biological products has become general.

In the distribution of these products it is, of course, evident that the primary requirements are that the products shall not be injurious or dangerous through faulty preparation and, where standards of potency have been established, that they conform to these standards. All reputable manufacturers of veterinary biological products have been fully aware of these essentials and a number have maintained groups of research workers with the objective of developing standards, of improving their products, and of ascertaining their value. Particular care has been taken by commercial firms to place these products on the market in the most convenient and pleasing form and this has resulted in their frequent use by laymen who do not understand their preparation and proper use. With an unrestricted open field and an increasing demand for veterinary biologics, advantage has been taken by individuals who were more concerned in gathering dollars from a gullible public than in producing reliable products, and the irresponsible noisy faker has been in a position to distribute unknown and untested preparations. It has been possible also to import veterinary biological products from countries in which there was no supervision or control of the manufacturing process and where serious foreign live-stock diseases prevailed.

The necessity for regulating the importation into the Dominion of these products was considered on several occasions and regulations were drafted for this purpose. There was difficulty encountered, however, because adequate laboratory facilities for testing products were not available. The licensing of manufacturing establishments in the United States by the Federal Government and the prohibition of the manufacture in certain countries had reduced the danger of inferior biologics imported into Canada. Further, the situation appeared to be reasonably safe in the Dominion since only a few manufacturers were preparing products. Owing, however, to the profits of the business and the extensive use of veterinary biologics, the possibility of the distribution of hastily prepared, dangerous or inert products by unknown manufacturers could not be overlooked. Definite action was stimulated by the evidence

furnished by a few investigations in which fatalities in live stock had followed inoculation with certain biological products.

The Department of Pensions and National Health had for some time been enforcing regulations in regard to the manufacture, sale and distribution in the Dominion of biological products for human use, but it did not exercise its power in regard to those prepared for veterinary practice. Officials of that department were freely consulted and much valuable assistance and advice was given by Dr. Norman MacL. Harris, Chief of the Laboratory of Hygiene, and Mr. H. M. Lancaster, Chief Dominion Analyst. Having been convinced that it was expedient and necessary for the protection of Canadian live stock to regulate and control the importation, manufacture, sale and use of veterinary biologics, the authorities passed an Order on May 12, 1934, under the provisions of the Animal Contagious Diseases Act.

PROVISIONS OF THE ORDER

The object of the measure is to ensure that veterinary biological products are correctly labelled and are not inert, outdated, injurious, or dangerous. It brings under its provisions aggressins, sera, viruses, toxins, tuberculin, mallein, johnin, abortins, vaccines, and micro-organisms intended for use in the treatment or diagnosis of diseases of domestic and fur-bearing animals, and poultry.

Permit Required for Importation

Importation into the Dominion of veterinary biologics for any purpose is prohibited unless a permit has been procured from the Veterinary Director General. Applications for permits must be made on forms supplied by the Department for the purpose and must include the name of each product, the name of the customs port at which entry will be made, the name and address of the manufacturer of each product and of the shipper. The official designating number, stamp or mark of products approved by countries in which their manufacture is officially regulated must also be shown. The importer must further agree to permit the taking of samples for potency, sterility and immunizing properties at any time it is considered necessary.

Each permit is given an official designating number and covers only the preparations named from specified manufacturing establishments. These permits are valid for the calendar year unless revoked for cause. A copy of each permit is promptly forwarded to the Department of National Revenue for the information of their port officers, who co-operate in the enforcement of this Order and refuse entry of any consignment for which a permit has not been issued.

Licence Required by Manufacturers

The manufacture of veterinary biologics within the Dominion is prohibited until a licence has been obtained from the Department. The licence is valid

for the calendar year unless revoked for cause. Applications for licences must be made on the form supplied by the Veterinary Director General and the Order requires an inspection to be made of the premises and prohibits the issuing of a licence if the report in this regard is not satisfactory.

The veterinary biologics which the manufacturer is permitted to manufacture must be specified in the licence and the manufacturer must not manufacture biologics other than those so specified. The Veterinary Director General may amend licences by adding or removing the name of any biologic and licences may be cancelled at any time the manufacturer fails to observe the regulations. All licences must bear an official designating number.

Requirements for Licence

In order to be eligible for a licence, establishments must meet fully the requirements of the regulations in regard to situation, buildings, equipment and personnel. The regulations provide that satisfactory methods must be employed throughout the preparation of the products. Animals infected with or exposed to any infectious or communicable disease must be properly segregated and those used in the testing or preparation of any product must not be removed from the premises except on the authority of the Veterinary Director General. It is required that a person in charge of the manufacture must have the training, skill and experience necessary for the work. Licences may not be granted to establishments which do not employ a graduate of a veterinary or medical college to supervise the manufacture of the products.

Control of the Products

Provision is made for the taking, by authorized officials, of samples of finished products and of any cultures, media, chemicals or other materials used in their preparation. Manufacturers must admit to all parts of the premises under licence any authorized official of the Health of Animals Branch at any time and must offer every facility for the investigation of the procedure followed in the manufacture, storage, distribution and recording of biologics. Licensed establishments must keep satisfactory records. Each lot of a product must have an identifying serial number and this serial number must be shown on the label of the product. A record of the persons and firms to whom the product has been distributed must be kept and this record must include the serial numbers of the biologics distributed. The manufacturer must also keep a record of the preparation of each product and of tests for potency, sterility and immunizing properties. He must forward to the Veterinary Director General, when requested, protocols of the testing. Labels and advertising matter must not include any false or misleading name or description and are subject to the approval of the Veterinary Director General. Further, each label must bear a return date, affixed before the biologic is removed from the establishment, covering the period of guarantee. The label must also state: "Licensed by the Department of Agriculture, Ottawa, Establishment Number" The Veterinary Director General must promptly notify the manu-

facturer at any time a product is found to be dangerous or of no value. The manufacturer must then promptly recall the product in question for disposal in an approved manner.

Canada has been fortunate in that it has not experienced epizootics of the serious plagues which have caused tremendous losses in other countries, such as pleuro-pneumonia, rinderpest and foot and mouth disease, and it has for many years followed a policy of eradication in regard to the other scheduled diseases which include anthrax, rabies, glanders and hog cholera. It is of primary importance, therefore, to prevent the general distribution of biologics containing living organisms.

Owing to the difference between the United States policy in regard to hog cholera—the simultaneous treatment with virus and serum—and that adopted by Canada—the eradication by slaughter methods—the importation into the Dominion and the manufacture, sale or use of hog cholera serum and virus has for many years been prohibited by a special order, except that the Department may import anti-hog cholera serum, which is used by its officers to assist in controlling outbreaks. The departmental tuberculin and other diagnostic agents used in connection with the Department's control policies are prepared at the Animal Diseases Research Institute, Hull, Quebec, by the pathological division of the branch.

There are only a few establishments manufacturing biologics in Canada for commercial purposes, but there is a large import business in these products and many problems must be considered in the enforcement of restrictive regulations. The standardization of biological products is a task of great magnitude and testing for potency and efficiency and for the determination of the time limit of activity and viability of these products requires an organization which will take time to develop. In the meantime, sterility tests will be undertaken and confirmation of potency and efficiency by other recognized investigators will be accepted.

SUMMARY

Under the provisions of the Order no person can legally import any biological products into Canada or manufacture them in the Dominion unless he is in possession of a permit or licence issued by the Department for that purpose.

The Order further provides the necessary authority for taking measures to prevent the distribution in this country of veterinary biologics which are not correctly labelled and those which may be inert, injurious or dangerous.

EDITORIAL SECTION

EDITORIAL BOARD

R. D. DEFRIES, M.D., D.P.H., *Chairman*
J. T. PHAIR, M.B., D.P.H., AND N. E. MCKINNON, M.B., *Associate Chairmen*
R. L. RANDALL, *Editorial Assistant*

G. D. PORTER, M.B., <i>Public Health Administration.</i>	D. T. FRASER, B.A., M.B., D.P.H., <i>Mental Hygiene.</i>
A. L. MCKAY, B.A., M.B., D.P.H., <i>Epidemiology and Vital Statistics.</i>	A. E. BERRY, M.A.Sc., C.E., Ph.D., <i>Public Health Engineering.</i>
A. L. McNABB, D.V.Sc., <i>Laboratory.</i>	C. ETHEL GREENWOOD, REG.N., <i>Public Health Nursing.</i>
GORDON BATES, M.B., <i>Social Hygiene.</i>	J. G. CUNNINGHAM, B.A., M.B., D.P.H., <i>Industrial Hygiene.</i>
E. W. MCHENRY, M.A., Ph.D., <i>Food, Drugs and Nutrition.</i>	JAMES CRAIGIE, M.B., Ch.B., Ph.D., D.P.H. <i>St. AND., Current Health Literature.</i>
MARY POWER, B.A., <i>Public Health Education.</i>	
R. R. MCCLENAHAN, B.A., M.B., D.P.H., and A. H. SELLERS, B.A., M.D., D.P.H., <i>Books and Reports.</i>	

NEW LIGHT ON TUBERCULOSIS CONTACTS

DURING the last decade an increasing number of reports on the results of periodic tuberculin testing of different groups of individuals have appeared in the literature. Among these are groups of nurses, attendants and medical students tested on commencing their hospital duties and periodically thereafter. In a considerable number clinical or X-ray examinations of the chest have been included. As a result, a large amount of data has been collected and generalizations have been made. The latter do not, however, permit of comparison because of the differences in the technique of the methods employed. It is known that among adults entering hospitals (where contact with tuberculosis is seemingly proven by the relatively rapid development of tuberculin sensitization), the disease tuberculosis, in different forms or manifestations, appears in both those who were tuberculin-positive or tuberculin-negative on entrance. Although the total number reported on has been in the thousands, the actual demonstration of the disease has been made in a relatively small number.

There are many questions which arise and which must be answered before definite conclusions can be granted. We cannot yet state what percentage of individuals lose their sensitivity, as initially indicated by a positive tuberculin test following infection, or the average duration of such sensitivity. Using guinea pigs inoculated with attenuated bacilli, it has been possible to obtain definite information concerning these questions, but such findings are not applicable to human beings. What percentage of *adults* develop a demonstrable *first infection type* and what the final outcome is, varies with the individual; but what, in approximate figures, happens a group of such individuals is not known. This could probably be arrived at were sufficiently large numbers investigated by methods that were comparable. Our conception to-day visualizes a different outcome where initial infection achieves a clinical "take" in the child and in the adult. We know to some extent the varied types occurring in the child, but what are the approximate figures in the adult? What percentage of the first infection type lesions persist, disappear, or have superimposed reinfection from within or without? From the different reports, instances are given of most of the end results that one readily visualizes, but not in sufficient numbers to permit more than conjecture.

Probably our conception is correct that the destructive, fibrosing, cavity-forming type of adult pulmonary tuberculosis is due to the fact that the clinical "take" occurred in an individual already sensitive to tuberculin. Tuberculin sensitization can well be regarded as a two-edged sword. It would not seem beyond the scope of our resources to arrange a sufficient number of surveys and continue this periodically in such a fashion that the findings would not only be comparable but would warrant logical interpretation. The periodic examination would have to be continued for a sufficiently long period to include those histories which the clinician experiences in the diagnosis of minimal or even extensive lesions. Students, nurses, doctors and hospital employees lend themselves particularly to such investigation at the minimum of cost.

In the present issue Professor S. Lyle Cummins of the Welsh National School of Medicine reviews the findings of 3,000 cases of tuberculosis to determine if *known contact* can be regarded as affording a certain amount of self-immunization furthering the amelioration of the disease and prolonging life. In other words, is "immunity to disease more to be acquired than inherited by the individual"? In answer to this question Professor Cummins draws attention, in his excellent analysis of this large group of cases, to the fact that approximately 40 per cent of the cases gave a history of known contact with tuberculosis and that among these known contacts the trend appears to be towards a relatively lower mortality. Whether it is a handicap or an advantage to enter early adult life as a tuberculin-positive or a tuberculin-negative individual must await further basic contributions such as Professor Cummins has made. Unanimity of opinion does not yet exist among those working in tuberculosis.

In this same issue a paper by Caulfeild and Anglin* is summarized on the results obtained in following tuberculosis contacts over an unusually long period of time. The authors have attempted to discriminate amongst their contacts those who might be regarded as likely to develop the disease, and therefore require closer observation, from those in whom the disease was unlikely to develop. They classify their cases according to the results yielded by the means of two serological tests frequently repeated. To obtain what they speak of as their "serological yardstick" they have used an average of the positive tests obtained in a long series of definite clinical cases of tuberculosis. Contrary to what might be expected, the tests in many individual cases of tuberculosis are positive in an alternating or irregular manner. This reflects apparently what does take place in the disease tuberculosis, although it is contrary to the conception usually held by serologists or clinicians as compatible with a satisfactory test or as to what a test should give throughout the course of the disease. The results have led these authors to make two statements which would appear to be of particular importance. The first of these is that no contact developed tuberculosis within a five-year or longer period of observation without warning of this being afforded by a deviation from normal in the tests. The second is that of those cases regarded as "serological

**The Futurity Handicap of the Tuberculosis Contact*, page 51.

suspects" showing such deviations, more than 40 per cent developed clinical disease. It is only fair to believe, from their study, that in some of the remaining 60 per cent the development of clinical disease was prevented by prompt clinical supervision made possible by the interpretation of these tests.

These are strong statements to make. If upheld, they would appear to advance very materially the control of tuberculosis, particularly if "known contact" is even approximately as important in the development of clinical disease as the 40 per cent reported by Professor Cummins. To be able to anticipate the development of clinical disease, and to select among the highly important group of known contacts those who should have particularly close observation, would provide a new approach to the problem of the control of tuberculosis. The findings call for the conduct of similar studies by a group of tuberculosis workers who are in such a position that periodic observations, including tuberculin testing, X-ray and clinical examinations, may be made on large groups of people, so that the value of the serological tests as the authors use and interpret them may be fully investigated. Facing the problem as Professor Cummins has presented the facts in his survey, every public health worker will welcome the promise of new assistance in adequately caring for contacts of known cases. The JOURNAL expresses the hope that a thorough investigation of the value of these serological methods will be undertaken in the very near future.

MINIMUM STANDARDS FOR HEALTH IN HOUSING

THE publication of the report of the Lieutenant-Governor of Ontario's committee on housing conditions in certain sections of Toronto has directed the attention of the citizens of that city to the urgent need of an adequate housing programme. With the report of the recent survey of housing conditions in Hamilton, made by Dr. James Roberts, Medical Officer of Health, and of a similar report regarding conditions in Winnipeg, we cannot continue to believe that we have not urgent housing problems in our Canadian cities. This is supported further by the discussion of housing conditions in Montreal as presented in this issue by Mr. Aimé Cousineau.

Medical officers of health are being called on to speak authoritatively on the relation of housing to health. No health officer questions the ill effects of bad housing and of the overcrowding often associated with it, but it is fair to say that no action which the health officer is required to take under the authority of existing legislation gives him greater concern and is fraught with greater possibilities of argument or even court action than the closing of houses which in his opinion are unfit for human habitation. The effort to define minimum requirements for health in housing as presented in the Toronto report might well lead to the adoption of appropriate minimum standards by health officers following a full discussion at the provincial and national meetings of the Association. The health officer urgently needs support for actions which he may take in housing improvement.

LETTER FROM GREAT BRITAIN

GEORGE F. BUCHAN, M.D., F.R.C.P., D.P.H.

London

THE STATE OF THE PUBLIC HEALTH

THE Annual Report for 1933 on the State of the Public Health in England written by Sir George Newman, the Chief Medical Officer of the Ministry of Health, has just been published. It is well worth reading if only for the reason that statistics are presented in an understandable form. Sir George Newman is the only man in England who really translates vital statistics. After stating the figures, he puts them into words. This is what he says:

"Although to the outside observer the general health of the country in 1933 was exceptionally good, it is clear that for many persons affected this cannot be more than a relative proposition. Not less than two million homes were stricken by death or disease during the year; there was distress and deprivation, physical and mental, in areas severely depressed by unemployment; and there was the burden of anxiety for physical risks and losses incurred in a mass of readily preventable sickness and accident which had been unprevented. Unemployment, undernourishment, and preventable malady and accident seem to be the unavoidable concomitant of current civilisation in Western Europe in the present day. We may suffer less than other nations, but we must never assume that our continued good national health can wholly preclude the inevitable effects of such conditions falling upon certain sections of the population."

I can imagine no more effective way of interpreting vital statistics than by making them speak of the homes of the people; of the distress suffered; and of the need for forethought in respect of measures for the prevention and maintenance of national health.

All the chapters in this report are of interest, some of them of exceeding interest, particularly those on tuberculosis and maternal mortality.

Tuberculosis

The year 1933 was the year in which tuberculosis schemes established originally under the provisions of the National Health Insurance Act

of 1911 reached their majority. These schemes were based on the conclusions of a sub-committee which sat under the chairmanship of Lord Astor. As operated, the anti-tuberculosis measures included three main features, namely, the tuberculosis officer, the tuberculosis dispensary and the sanatorium. As a result of the operation of these measures over a period now of more than 21 years, methods of diagnosis and treatment in tuberculosis cases have improved, the sanatorium has become a sanatorium hospital—"a place of dynamic and forward looking education and treatment", a place for occupational therapy and for medical and surgical relief, leading to the re-establishment of the patients. The village settlement and after-care work have also developed as important elements in relation to the organized national attack on tuberculosis.

In spite of these developments, Sir George Newman has to record that there is still delay in notification and that the relatively slower decline of this disease in women between 15 and 25 years of age requires special consideration. It is indeed suggested that this may be attributable to the higher strains which industrial occupation is imposing upon women, combined with the fact that when a woman leaves her work, she usually has domestic duties afterwards. A friend of mine who had been studying this section of Sir George Newman's report, put it to me the other day that it would almost appear that the young woman of to-day is undermining her health by her desire to be economically independent and yet have a home of her own.

Generally, however, great progress falls to be recorded in respect of tuberculosis, the death rate from

pulmonary tuberculosis having fallen from 3,478 per million persons in 1851-60 to 993 in 1921-30 and to 799 in 1933. Sir George Newman very properly points out that this remarkable decline, while no doubt accelerated by the special anti-tuberculosis measures adopted, is nevertheless due to a combination of factors of great variety, "the improved environment of the whole population, sanitation, water supply, housing and reconditioning of houses, the rehousing or segregation of tuberculous persons, the immense reduction of "spitting" in public places and even in public houses, the improvement of the milk supply and pasteurization, industrial welfare and factory hygiene, the improved dietary of the people since 1851, the practice of the open air life, dress reform, the school medical service and the ever widening scope of education."

Maternal Mortality

It is a noteworthy fact that the maternal mortality rate for the last 20 years has remained static at or about 4 deaths per thousand births. This is rather depressing in view of the large amount of work that has been done for maternity and particularly in view of the fact that during the same period the infantile mortality rate has fallen from 130 in 1911 to 64 in 1933 and that the mortality from tuberculosis of bones and joints has similarly been halved during the last 20 years.

Sir George Newman advises that we must not become impatient for some more striking success; that we must carefully and periodically review our methods and if need be, try new methods in order to reach the goal we desire. The recommendations of the Maternal Mortality Committee are particularly emphasized, namely:

- (1) The need for sufficient ante-natal care.
- (2) The need for the complete examination of the mother both in respect of her general health and in respect of the uterine condition.

- (3) The importance of the hygiene of pregnancy, including personal health and nutrition.

- (4) The need that the same person should both supervise and deliver; and

- (5) The effective co-ordination of all the responsible parties to a safe delivery.

The Chief Medical Officer of the Ministry of Health emphasizes the importance of the state of nutrition of the mother during pregnancy. He states that instruction in dietary as well as personal hygiene should be given at every ante-natal centre.

Sir George Newman also refers to the established fact that one of the principle causes of failure in mid-wifery is too much or untimely intervention.

While Sir George Newman indicates that the foregoing considerations are of great importance, he nevertheless indicates that there are other factors which contribute to the high maternal mortality, for example, the increased proportion of women having primary births compared with subsequent births, and the substantial increase in abortion.

The whole subject of maternal mortality is reviewed and dealt with in the Annual Report in a most broad-minded and illuminating way. I have singled out the foregoing points as of extreme importance to the public health administrator but there are nevertheless many other factors, all dealt with by Sir George Newman, worthy of consideration, attention and enquiry.

The whole report is one of 295 pages. It teems with interest to the public health worker from beginning to end and the general conclusions as to the state of the public health in England and Wales are the result of a close scrutiny of the statistical information and logical deduction therefrom. The Annual Reports of the Chief Medical Officer of the Ministry are models of what health reports should be and I heartily commend the report for 1933 for reading in extenso by all medical officers in the Canadian public health service.

THE BIRMINGHAM HOSPITALS CENTRE

IT may interest my readers if I tell them something about the first Hospitals Centre to be inaugurated in Great Britain.

The Hospitals Centre is an economic and logical co-operation of effort and co-ordination of hospital and health facilities and its object is to get organized team work as opposed to isolated effort. Its four main functions are: (1) treatment of the sick; (2) training of medical students and nurses; (3) research; and (4) constructive health building.

On the morning of Tuesday, October 23rd, His Royal Highness the Prince of Wales laid the foundation stone of the Birmingham Hospitals Centre and cut the first sod on the adjoining site reserved for the new Medical School buildings.

It is now fourteen months since work began on the site and the building of the first instalment of the Hospitals Centre is making steady progress. The first instalment will consist of a general hospital of 500 beds with all auxiliary and ancillary services, nurses' home and the new Medical School buildings, and it is anticipated that it will be completed and open for the admission of patients in October, 1937.

The origin of the scheme goes back to 1920. The city was not satisfied with the existing condition of the hospital and medical services. The two leading general voluntary hospitals had an increasing deficiency in beds relative to the demands made upon them and the growth of the population. The city, in place of the old-fashioned and uneconomic extensions to existing hospitals in crowded and noisy parts of the city which even if carried out would have given a result far short of what was desirable, embarked on the present alternative and more comprehensive scheme.

At the present time the most urgent need in Birmingham is for medical and surgical beds and provision of these with the associated auxiliary

and ancillary services forms the first stage of the scheme. The Special Hospitals of the city are already associated with it and in due course will have the opportunity of working out with the Executive Board of the Centre plans for their future development on the site reserved for them.

The Site

The site which was presented to the city is one of 150 acres, situated at the north-west of and adjoining the University buildings at Edgbaston. The site is within $1\frac{1}{2}$ miles of the city and is an open one 455 to 505 feet above sea level in its different parts, so the Centre on it should enjoy comparative freedom from smoke, noise and dust. Out of the whole site 100 acres are reserved solely for hospital purposes, 25 acres for the General Hospital and 75 acres for the Special Hospitals. The remaining land will be recreation grounds and open spaces. The area is sufficient to provide scope for all hospital developments for the city for at least 50 years.

The Hospital

The General Hospital of the Centre will, when completed, contain 740 beds, made up as follows: medical 240; surgical 300; children 60; gynaecological and obstetrical 60; casualty 20. The beds will be organized in units of 60, each complete in itself with all necessary auxiliary services. Each unit will be composed of 30 beds for women and 30 for men, made up of one ward of 16 beds, two wards of four beds and three wards of two beds. The largest ward will therefore contain only 16 beds—an advance on the usual large wards in this country. All beds will be on the south side of the hospital and provision is being made to allow of at least one-fifth of the patients receiving open-air treatment. The hospital will contain seven operating theatres and provide the most modern methods of special treatment.

Provision will be made for paying

patients by the erection of a separate block of 100 beds (50 of them in single rooms) specially planned for the purpose.

The Medical School

The new Medical School of the University of Birmingham will be erected on the south part of the site and will contain all the departments essential for the curriculum of the medical students. The maintenance will be a responsibility of the University and not one of the Hospital.

In order to make an early start, the scheme has been divided into two

instalments and it was decided to proceed first with the provision of a General Hospital of 500 beds, the Nurses' Home and Medical School. In the past four years the sum of £735,000 has been collected and it is hoped that the additional sum of £250,000 needed for the first instalment will be in hand by the time of its completion in October, 1937.

Once the first instalment is in operation, the second instalment consisting of the paying patients' block, outpatient department and a further 250 general beds will be put in hand to complete the scheme.

EPIDEMIOLOGY AND VITAL STATISTICS

ENDEMIC INDEX FOR DIPHTHERIA, SCARLET FEVER, MEASLES AND WHOOPING COUGH IN THE PROVINCES OF CANADA AND MORBIDITY RATES, JULY-DECEMBER, 1934

*Department of Epidemiology and Biometrics, School of Hygiene,
University of Toronto*

IN the September 1934 issue of the *Journal* the monthly distribution of morbidity for the four communicable diseases of childhood was presented for the year July 1933-June 1934, and compared with the endemic index for each disease in each province. For the determination of the endemic index the method of average was used. The same method has been used for the indices presented here but the averages have been advanced a year to include the cases occurring from July 1933 to June 1934.

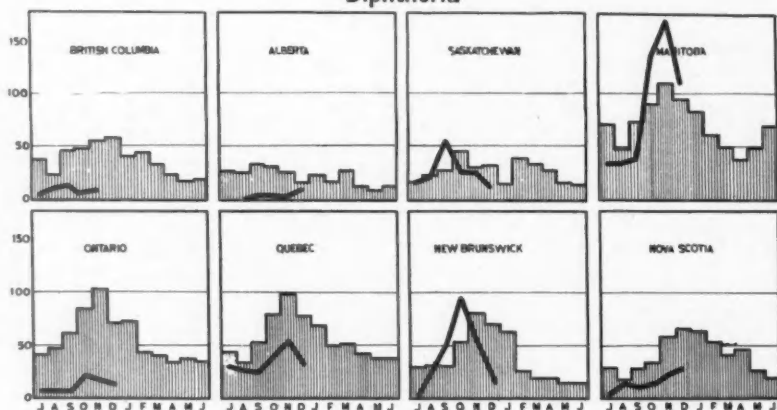
The monthly reported incidence as shown in the accompanying diagrams covers the six months July to December, 1934. The incidence for each of the diseases has been presented as mortality rates per 100,000 population and not as the number of cases.

Comparison of the incidence for the

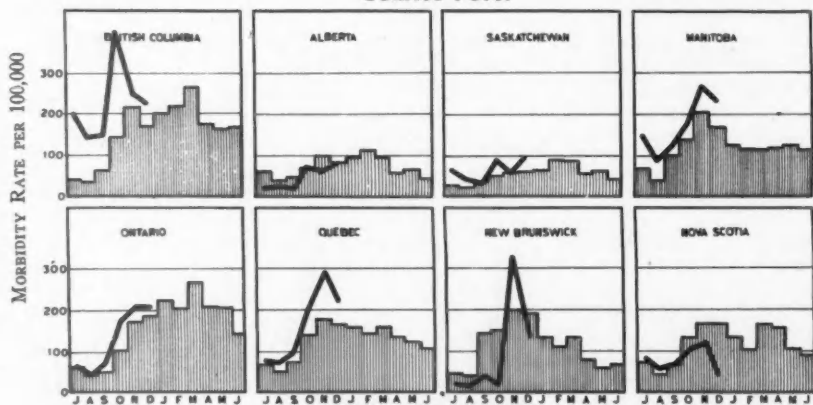
current year with the preceding experience for a province may be made in a general way, but due consideration should be given to the effect of specific immunization and to changes in the population or in the completeness of reporting of cases in the individual provinces. The data for all these diseases are very incomplete and are probably less complete in some provinces than in others. Any comparison of the incidence made between different provinces from these data would require investigation of the completeness of reporting in the provinces compared. Diphtheria and scarlet fever are probably reported much more completely than whooping cough and measles.

Diphtheria.—As presented in Figure I, the incidence of diphtheria was below the endemic index (average for

Diphtheria



Scarlet Fever



Whooping Cough

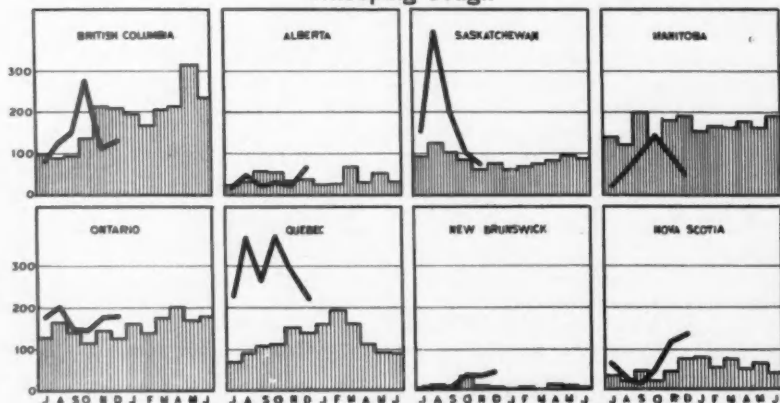


FIGURE 1.—Monthly morbidity rates, July-December, 1934, for eight provinces of Canada, with the endemic index. The morbidity rate is represented by the black line and the endemic index as shaded bars.

five years) for all the provinces except Saskatchewan, Manitoba and New Brunswick for each month of the period July-December 1934. In Manitoba the incidence is much greater for the months October, November and December, and in New Brunswick for the months September and October. In Saskatchewan the incidence is greater only for September.

provinces of Quebec, British Columbia and Saskatchewan.

Measles. — British Columbia, Alberta and Ontario have rates below the average, as shown in Figure II. Manitoba, Quebec, New Brunswick and Nova Scotia are well above the average, showing evidence of epidemics. In Saskatchewan the rates

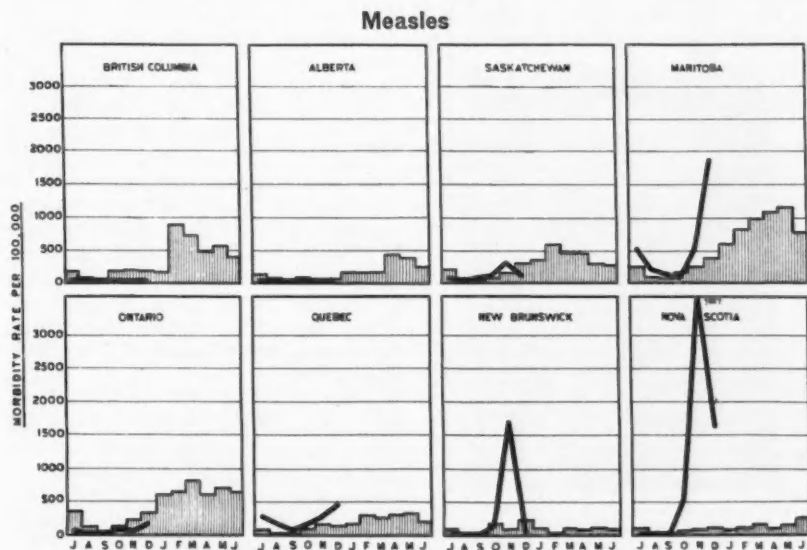


FIGURE II.—Monthly morbidity rates, July-December, 1934, for eight provinces of Canada, with the endemic index. The morbidity rate is represented by the black line and the endemic index as the shaded bars.

Scarlet Fever.—The monthly incidence has been above the average for six of the provinces for the majority of the months of the period. In Nova Scotia it has been below the average except in July and August and in Alberta below the average for the whole six months' period.

Whooping Cough. — The reported incidence in Manitoba is below the endemic index except for the month of October and in Alberta for four of the six months reviewed. In the other six provinces the incidence is higher. This is most marked in the

are slightly above the average for three of the six months.

The presentation of this comparison for a six months' period gives a picture of the trend of the four diseases in the various provinces. It affords a convenient method for comparing present with past incidence, provided that due consideration is given to the various factors that may have influenced the trend of the different diseases. The weekly or monthly endemic index as prepared and used locally gives immediate information to the health officer of the appearance of an epidemic.

RETIREMENT OF MR. E. S. MACPHAIL

AFTER more than thirty-three years' association with the statistical service of Canada, during which he took part in the administration of four decennial censuses of the Dominion and three quinquennial censuses of the Prairie Provinces, Mr. E. S. Macphail has retired as Chief of the Demography Division of the Dominion Bureau of Statistics.

Mr. Macphail was born in Prince Edward Island. After completing his



MR. E. S. MACPHAIL

education at Prince of Wales College, Charlottetown, he engaged in teaching, later becoming secretary to the Board of Education of the province. In March, 1901, he entered the Civil Service of Canada as Chief Clerk in the Fourth Census. Shortly thereafter he was appointed General Superintendent of the office force employed in revising, editing and compiling the census data. When the census staff was disbanded, Mr. Macphail was asked to remain to assist in creating a permanent census office force. In 1905 he was given the task of preparing schedules and instructions and organizing the staff for the first census, in 1906, of Alberta and Saskatchewan. In 1907 he was appointed Superin-

tendent of Compilation of the Census. For the 1911 census he introduced into the census office a system of mechanical tabulation and supervised the building and the installation of the machines. The introduction of mechanical appliances made possible the compilation of subsequent censuses with much more detailed and elaborate classifications.

In 1918 Mr. Macphail assisted in the organization of registration under the Canada Registration Board and had charge of the office staff engaged in the compilation of the results. In the same year he prepared a plan for standardizing the collection of statistics of marriages, births and deaths. This scheme was presented to a conference of Provincial Registrars General and others interested in June, 1918. In the same year the Dominion Bureau of Statistics was formed and Mr. Macphail was appointed Chief of the Demography Division. This division at first embraced only the census, but included also vital statistics from the establishment in 1920 of the national system of compiling these statistics following a second conference in December, 1918, at which Mr. Macphail was directed to put into operation the plans outlined.

The importance of the contribution which the Dominion Bureau of Statistics has made to the promotion of public health in Canada is recognized by every health administrator. To have created a Dominion-wide registration area, to have given leadership in all matters pertaining to vital statistics, and to have gained in the effort the hearty co-operation of all interested parties, are achievements of which the Bureau may well be proud. Under the direction of Dr. Coats, Dominion Statistician, Mr. Macphail has been largely responsible for the success of these efforts. To the Dominion Bureau and to Mr. Macphail the appreciation of all the forces of organized public health is due.

PUBLIC HEALTH NURSING

THE URBAN RELATIONSHIPS OF THE PUBLIC HEALTH NURSE*

MARY S. MATHEWSON, REG. N.

Child Welfare Association, Montreal, Quebec

SOME years ago Mary Gardner listed "relationships" as one of the four major problems of public health nursing. That it is still a problem is shown in the findings of the recent survey† made by the National Organization for Public Health Nursing in the United States. The day has passed when public health can be treated as a problem independent of economic, social and educational conditions, and if that be true of the public health problem in general, it is quite as true of public health nursing. A close interrelating of public health nursing with all other health and social agencies of the community is of the greatest importance in carrying out completely and productively the purposes of each. Even in cities in the old days nurses' professional contacts were limited to contacts with physicians. In the early period of district nursing there was little difficulty in this respect because the nurse called on the church worker, or so-called charity visitor, for little else than material relief. As the education and the field of service of both types of worker has broadened, and as new professional groups have been developed, such as nutritionists and psychiatric social workers, relationships have become much more complex, requiring a wise apportionment of responsibility. Where does the responsibility of one worker end and that of another begin? This is still a major problem facing all community workers at the present time and our leaders are giving the matter a great deal of thought. It is incumbent on us to be fully aware of the

problem and to be prepared to help in finding a solution. We can be prepared by taking stock of our assets and liabilities. The crux of the whole matter may be expressed in the question, What is our *chief* interest? Is it to provide the best possible care for the people for whom we are responsible, or to maintain a dog-in-the-manger insistence on our "professional rights"?

I think we may safely say that public health nurses *are* genuinely interested in their people and are really working for their betterment. In medical circles the calling in of specialists to help in making a diagnosis is an established practice and the actual treatment may be handed over to a specialist. Why? Because it is in the best interests of the patient. The general practitioner may later become a specialist himself, but only after years of study and experience. If we accept this principle in medicine, why not apply it to nursing? Our colleges do not graduate specialists; neither do our nursing schools. In your own undergraduate days what did you learn of mental health and early symptoms of deviation? What did you learn of social maladjustment, family difficulties, or of an adequate food budget for a family? Is it not unreasonable to expect to gain this knowledge by the trial-and-error method at the expense of your patients when you could secure expert advice or treatment by calling in a specialist, or securing specialised preparation yourself? One of our main reasons is that so many of us have felt that the calling in of a special worker is an

*Presented before the Public Health Nursing Section at the Twenty-third Annual Meeting of the Canadian Public Health Association, Montreal, June, 1934.

†Survey of Public Health Nursing, by the National Organisation for Public Health Nursing. Published by the Commonwealth Fund, Oxford University Press.

Note: The rural relationships of the public health nurse will be discussed in the February issue of the Journal.

admission of failure. We cannot all be specialists in everything! Another reason is that we have kept so close to our work, frequently of necessity, that we do not know what other workers and agencies are doing, nor have we taken time to meet together to devise a plan of co-operation, as reasonably sensible people should do. As the senior workers in the field, was not this our responsibility and opportunity?

In urban areas our problem is greatly increased because of the great number of workers and agencies in the field and the difficulty in knowing these workers personally. This places us at a disadvantage, for misunderstandings are so much more likely to occur and abuses of service to creep in where personal contact is not possible. To make full use of all community resources is a fundamental principle in public health nursing, and yet the aforementioned survey states that "Relationships between public health nursing and other health and social agencies, if they exist at all, are for the most part casual and haphazard." Although this applied to conditions in the United States, it applies equally well to conditions in Canada. Why is this the situation? Is it because the value of such relationships is not realised or because we lack the knowledge necessary for developing a definite method or technique?

With what groups do we need to work very closely, and how may these relationships be brought about?

1. *Medical and dental professions, organized and private*

Our problem here is fairly well solved.

2. *Official and voluntary health agencies with nursing services*

(a) *The health department*

The local board of health is the locally appointed body entrusted with the health of the community. It is our duty to know what is being done in the department as a whole and to work with the department.

(b) *Voluntary agencies doing public health nursing, including the Red Cross Society and tuberculosis groups, etc., clinics and social service departments of hospitals, out-patient departments, mental hygiene clinics, etc.*

It is essential that we have a knowledge of the objectives and of the programmes of each of these organizations and that we have a definite policy of referring and reporting cases.

3. *Social agencies in the community*

If a Community Council exists, the nurse should be a member. If a Social Service Directory has been established and joint meetings are possible, advantage should be taken of such opportunities in order to know at least the workers in your own district. An understanding of the aims and programmes of such groups as family welfare associations, the Public Welfare Department of the city, and other case-working and relief agencies is essential.

4. *Organized groups who support or participate in health work*

Service clubs, women's clubs and other groups are participating in health work to an increasing extent. Co-operation with special committees of such clubs in various health projects and accepting invitations to take part in their meetings, presenting the health programme, afford relationships that are most helpful and often result in interesting them in giving financial assistance for special projects.

5. *Lay groups, individuals, and the community at large*

The organization of a lay advisory committee which meets regularly may be very helpful to the nurse in developing and interpreting the programme. Volunteers may render assistance in the arrangements for the periodic health examination or may be invaluable to clinics by providing motor cars. Help may also be given by them in arranging publicity. There is a great opportunity for a wider development in the services which can be rendered by volunteers in acquainting the community with the programme. Special educational programmes for new board members and volunteers, as provided in Montreal, are worthy of consideration, for volunteers do require instruction and systematic supervision.

To make good health possible is a definite responsibility of public health nursing organizations. Naturally, social conditions, poor housing and emotional instability, have marked influence on the health of the family and society. The nurse may help very much by her interpretation of the health needs of the family, for as yet no other worker has the necessary training or experience to do so.

We are told that co-operation is the secret of world peace, that co-operation is the secret of successful community service; in fact, that co-operation is the most essential factor in

our complex modern life. This word "co-operation" has been much overworked and is losing some of its effectiveness, but the underlying principle remains the same, call it what you will. It implies mutual understanding and good working relationships. It is not enough for heads of organizations to be ready to work together, but everyone down to the most junior staff worker must be taking part. I am greatly impressed by the similarity between this process and the assembling of a car: every worker must put in his particular bit at the right time. If one worker were not in his place and his piece should be left out, the finished product might look the same to a casual observer, but the result might be disastrous.

One word of warning as we enter into such a wide programme of relationships. While we agree that we should not do for our people what can be better and more wisely done by others, we must realise the essentially harmful result of leaving only routine duties for public health nurses,

or for any other group of workers. We must look ahead and see that each group retains sufficiently interesting and stimulating functions and activities to ensure the entry and retention of the finest type of worker, for community service needs the best there is. In the nursing world public health nurses are regarded a good deal as is the small toddler in the home—investigating everything, exploring, asking endlessly—"Why?" and generally upsetting the family routine. This is a sign of normal development and growth in both cases. In time the older members of the nursing family may have reason to be proud of the youngest member.

"Good" children, as John Dewey pointed out, are those who do not annoy their elders. Likewise "good" public health nurses are those who do not annoy their co-workers but who, in spite of this, let me add, manage to make the fullest use of all community workers and their resources for the benefit of the families under their care.

BOOKS AND REPORTS

Maternal Mortality in Philadelphia.

Report of the Committee on Maternal Welfare, Philadelphia County Medical Society. Printed by James M. Armstrong Inc., 2116 Locust Street, Philadelphia, Pa., 1934. 143 pages. Price, \$1.00.

This volume presents in compact form the results of a careful study of 717 maternal deaths occurring in Philadelphia during the 3 years 1931-1933. The investigation was conducted in a similar fashion to that employed in the recent work carried out in New York City in that the data were collected by direct investigation of history records and by personal interviews with the physician, nurse or friends of the respective cases.

A detailed statement of the findings in deaths from each specified puerperal cause, together with the opinion of the medical committee reflected in the comment and discussion, constitutes the major portion of the report. The part played by abortion is striking, ranking first in order of all puer-

peral causes of death. Over twenty-nine per cent of all "true" puerperal deaths were ascribed to this cause. This fact would seem to be indirect evidence that abortion is increasing in prevalence.

Sections of the report are devoted to a discussion of the relationship which exists between maternal risk and such factors as age, parity, race, operative interference and illegitimacy, as brought out by the data of this study. The pages devoted to preventability of death confirm the findings of others, about three-fifths of all the puerperal deaths studied being preventable in character. In addition, the Committee assigned the responsibility for these preventable deaths to either physician or patient under certain specified conditions. One of the important social aspects of the problem of maternal death is brought out by the finding that on the average a woman dying after a pregnancy of 28 weeks or over leaves more than 2 living children.

This report on mortality from causes in-

cident upon pregnancy and childbearing reflects the need for consistent social effort, sound medical training in obstetrics, and the administration of hospitals dealing with obstetrical cases in the light of modern conceptions of this problem. "Maternal Mortality in Philadelphia" adds further to our knowledge of this great world problem as it affects a large urban community.

A.H.S.

Papers of Charles V. Chapin, M.D.
Selected by Frederic P. Gorham, A.M., Sc.D., edited by Clarence L. Scamman, M.D., with a foreword by Haven Emerson, M.D. Published by The Commonwealth Fund, 41 East Fifty-seventh Street, New York, N.Y., 1934. 268 pages. Price, \$1.50.

These papers have been selected from the many delivered by Charles Value Chapin for their content of necessarily permanent principles that he contributed to the practice of preventive medicine. They were all written while Dr. Chapin served the city of Providence as its Superintendent of Health, and during his years of office (1884-1932) the modern conception of public health work developed. With his insatiable curiosity as to causes and effects, he sought the truth among the data available in the carefully kept records of his department.

The book is divided into three parts. The first part is a collection of papers on public health administration which are addressed primarily to the health officer. Significant recommendations are included in these papers relating to the danger of hasty publicity, the assimilation of new scientific knowledge and techniques, and the wisest expenditures of public funds. The first of these papers is an address, "Pleasures and Hopes of the Health Officer", delivered to the American Public Health Association at Winnipeg in September, 1908.

The second part consists of papers relating to the control of communicable disease. The most interesting of these is "The Fetish of Disinfection", read before a section of the American Medical Association in 1906 where Dr. Chapin stood alone in his conclusions that terminal disinfection for communicable diseases was more a superstition than a practical procedure. He showed himself to be the only health officer who was seeking answers to his problems through sound experimentation. In another paper he recommends as a substitute for terminal disinfection, aseptic nursing, concurrent selective disinfection, isolation through hospitalization, or, less expensive and more practical, nurs-

ing visits to the home, the search for carriers, the reporting and recording of cases, and education and use of the laboratory. Since these recommendations were given, they have all become essential measures in controlling communicable diseases.

The third part is related to epidemiology and vital statistics. Dr. Chapin's methods of collecting facts, comparing data and estimating ratios and his study on the proper use of vital statistics have long become known in America as models in public health methods.

The book, of course, serves only as an introduction to Dr. Chapin's views on public health. In the bibliography are references to 132 of his papers, many of which will be classics in the fields of public health. The whole collection is a succession of stimuli to workers in all fields of public health, and one especially feels that it should be on the bookshelf of every medical officer of health. To the Commonwealth Fund and to Dr. Scamman and Dr. Gorham the hearty thanks of the public health profession in Canada are extended for making available in such excellent form a selection of Dr. Chapin's papers. K.F.B.

International Clinics. *A quarterly of illustrated clinical lectures and especially prepared original articles. Edited by Louis Hamman, M.D., Visiting Physician, Johns Hopkins Hospital, Baltimore. Volume II, Forty-fourth Series, 1934. Published by the J. B. Lippincott Company, 525 Confederation Building, Montreal, Quebec. 317 pages. Price, per volume, \$3.00; for the four volumes of each series, \$12.00.*

As is well known, *International Clinics* is published quarterly and brings a series of clinical presentations in medicine, surgery, obstetrics and paediatrics to the practising physician. The fact that the publication is in its forty-fourth series indicates its appreciation.

Of particular interest among the 14 papers in this volume is an excellent review of immunization procedures in diphtheria and scarlet fever by Dr. Lawson Wilken of Johns Hopkins University. Here one finds the whole story of the development of the present methods, with collected findings of many clinical reports, together with a helpful bibliography. Likewise the pathogenesis of anterior poliomyelitis by Thelma Lovett is a particularly valuable review to everyone interested in the prevention and treatment of this disease.

R.D.D.

CURRENT HEALTH LITERATURE

These abstracts are intended to direct attention to articles that have appeared in other journals during the past month. Any of the journals referred to may be borrowed for three days or longer if desired. Address requests to the secretary of the Editorial Board.

The Futurity Handicap of the Tuberculosis Contact: A Consideration of Data relative to the Pre-Assessment and Prevention of Clinical Disease

Two serological tests have been used by the authors and repeated over long periods of observation. The results have been used as a means of indicating the probability of the advent of clinical tuberculosis. The first part of the paper shows the frequency with which the two tests are positive in cases of clinical tuberculosis. Two groups of clinical cases are taken with the idea of obtaining a cross-section of the disease tuberculosis. All cases are positive clinically and one group taken includes only those under observation for five years or more and on whom ten tests or more have been done. The second group includes only sputum positive cases admitted to the wards of a general hospital. The approximate results obtained were: 50 per cent of the T.C.F. tests and 20 per cent of the inhibitive reaction tests were positive. Controls (obtained from tuberculin-negative normals) showed that approximately 10 per cent of the T.C.F. and 2 per cent of the inhibitive tests were positive.

These results were taken as a sort of serological yardstick and applied to a group of tuberculin-positive contacts who had been under observation for five years or more and on whom ten tests or more had been carried out. The cases used for illustration show great individual variation and are presented in the form of a graph, together with a short clinical history and X-ray reproduction.

The authors close their paper with the following summary:

1. As a result of prolonged observation on cases of clinical tuberculosis in which dual serial serological tests had been taken, we have struck an average from the number of positive tests obtained. Each graph is about as individualistic as each case is clinically individualistic, and as a result we have obtained an inexact yardstick.

2. An average of positive serological results obtained in tuberculin-negative nor-

mals was struck as evidence of the percentage of laboratory error for the tests.

3. We have given illustrations to show that the serological graph may be similar whether the extent of pathological involvement be far advanced or minimal. The number of such illustrations could be multiplied sufficiently to show, we believe, that this is fundamental.

4. Applying this serological yardstick to tuberculin-positive individuals (most of whom were known contacts) we have shown that tubercle was finally demonstrated in over 43 per cent of those whose graph was regarded as either positive or near positive. None developed disease whose graph was negative. Furthermore no case developed tuberculosis without warning being afforded of this by a deviation from normal in the serological graph.

5. The longest period in a minor from the initial observation, while the individual was under contact, to the demonstration of disease was twelve years; the longest period in a middle-aged adult from the first positive tuberculin test was twenty-two years; the shortest period in a middle-aged adult (starting as a tuberculin-positive normal) from the first positive serological test was under two years.

6. While we believe dual serial serological tests have a practical application in the handling of the clinically tuberculous, we hope we have demonstrated that, from a public health point of view, they have a distinct and more important value in enabling us to discriminate amongst the tuberculosis contacts (tuberculin-positive individuals) those who should be closely followed and kept under adequate periodical observation.

7. Tuberculin positiveness indicates the previous implantation of *B. tuberculosis* and the formation of an anatomical tubercle. The establishment of a suggestive number of positive serological results would seem to demonstrate that the individual is on the threshold of or actually suffering from clinical disease and should be periodically

examined; the actual demonstration of bacilli or X-ray proof may take years.

A. H. W. Causefield and G. C. Anglin, *Am. Rev. Tuberc.*, 1934, 30: 619.

Epidemic of Poliomyelitis in California, 1934

The outstanding features of this epidemic were as follows. The beginning, maximum and subsidence of the epidemic was remarkably early as regards season, the maxima in the four centres of high incidence occurring in May and June. A prominent feature of the epidemic was the occurrence of typical cases. Against the hypothesis that more than one epidemic disease was present is that in various parts of the state atypical cases were reported roughly in proportion to cases of frank poliomyelitis. The case fatality rate was low even if only paralytic cases are considered. There was high communicability, as shown by the high incidence in hospital personnel and the occurrence of multiple cases in 12.5 per cent of households. An unusually high proportion of adults was attacked; there was a marked predominance of adults among those whose attacks were atypical. All the evidence at hand indicates the usually accepted mode of spread, *i.e.*, contact with human carriers and, to a much less extent, recognized cases.

Leake, Cedar, Dearing and Gilliam, *Am. J. Pub. Health*, 1934, 24: 1204.

Poliomyelitis in California, 1934

By May 1st 61 cases had been reported from the beginning of the year, as against 20 for the corresponding period in 1933. Apprehension that another epidemic was due led to the organization of a Poliomyelitis Advisory Board to advise and determine policies and control measures. The programme carried out is described. The public was kept informed of the exact status of the epidemic through the press and radio. Consequently a large majority of the cases were discovered in the preparalytic stage and fully 90 per cent were hospitalized. When a case or a suspected case was reported, a trained diagnostician made a thorough examination and epidemiological investigation. A trained nurse or physician checked contacts regularly for secondary cases. Schools were continued as in normal years, with additional provisions for daily medical inspection and prompt reporting of suggestive symptoms.

The total incidence for the epidemic was 630, with a case fatality rate of 1.5 per cent. Of 235 cases receiving serum in the 1st to 3rd day of onset, 90 per cent were normal on release from hospital as proved by muscle check, while 10 per cent showed weakness of certain muscle groups. Thirty-five cases were found to come in the paralytic class. Of these, 25 received serum very late (5th to 12th day), while 10 either were missed or refused serum. The low case fatality rate and small percentage of residual paralysis may to a certain extent be credited to three factors: (1) early diagnosis, (2) early hospitalization and administration of convalescent serum, and (3) proper orthopaedic care.

J. L. Pomeroy and George H. Roth, *Am. J. Pub. Health*, 1934, 24: 1201.

Use of Serum and the Routine and Experimental Laboratory Findings in the 1934 Poliomyelitis Epidemic

The preparation of the sera used is described. An unusual opportunity was provided for the study of the prophylactic value of the serum since among the Los Angeles County Hospital employees alone, 115 developed poliomyelitis. In the Communicable Disease Unit 11.9 per cent developed poliomyelitis as against 1.3 per cent of employees in other parts of the hospital, while 36 per cent of nurses of the Unit living in the nurses' dormitories developed poliomyelitis. No evidence was obtained which indicated that those receiving serum prophylactically were more immune. In the Communicable Disease Unit 14 per cent of 228 receiving poliomyelitis serum developed paralysis, as against 9.7 of 261 not receiving serum. There was some evidence that those receiving serum developed less paralysis than those receiving none, but the numbers are not large enough to be significant. The absence of control groups prevented the evaluation of the therapeutic value of the serum. Convalescent pooled serum was no more effective than normal pooled serum. A small percentage showed serum reactions to a varying degree and a high percentage of these responded to skin sensitivity tests with human serum. In 27 per cent of cases the spinal fluid showed no cells and 35 per cent showed more than 10 cells. The virus was transmitted to monkeys in 5 out of 11 autopsy cases. These strains show an antigenic relationship to the M.V. strain.

Kessel, Hoyt and Fisk, *Am. J. Pub. Health*, 1934, 24: 1215.

